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Physical Standards for Factory Employment
—*C. S. Carney*

Validating the Questionnaire Method
—*Herbert A. Toops*

News Notes Book Reviews Abstracts

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# Physical Standards for Factory Employment

By C. S. Carney, *Cleveland, Ohio*

*Physical examinations of 4000 applicants for employment with the White Motor Company are here reported and analyzed by Mr. C. S. Carney who is Research Assistant to the Personnel Director, D. W. K. Peacock. Mr. Carney shows the worth of establishing standards of general physique and eyesight. He describes a system of physical classification, and gives typical forms which have proved useful in placing applicants in jobs for which they are best adapted.*

PROGRESS in any science has always been dependent upon increasing accuracy in making observations and definiteness in recording these observations. The development of units of measurement and of precision instruments has been the essential to the advance, not only of the physical sciences, but of the natural sciences as well. If the handling of men in their industrial relations is to become scientific, it will be so only as standard units are established and means of more precise measurement are developed.

Standardized application blank, job specification, mental test and physical examination are all instruments for the more accurate measurement of the fitness of the man for the job. But there is need also for more definite specification of the job requirements in units which can be measured by the examining physician.

In a plant employing several thousand workers it is impossible for any one person to be familiar with all the conditions surrounding each of these hundreds of jobs. Especially is this true of the examining physician, whose advice regarding the physical fitness of the applicant for the job is most important, but whose duties prevent him from spending much time in the operating departments, studying the working conditions. There is need, therefore, for a more definite classification of jobs according to their physical requirements.

## CLASSIFICATION OF PHYSICAL REQUIREMENTS

To meet this need in one large manufacturing plant a committee was formed, including in its membership Employment Manager, Industrial Physician, Surgeon, and Oculist, as well as operating department heads. This committee classified all jobs upon two bases: first, according to eyesight requirements, and second, according to general physique needed.

*A. Eyesight requirements*

All jobs were divided into three classes according to eyesight requirements as follows:

Class V-1. Jobs requiring good vision, strong illumination, and use of micrometers or other fine scales. All clerical work.

Class V-2. Machine work, bench jobs, assembly of parts, etc., not requiring especially good vision for adjustments.

Class V-3. Labor, handling of heavy parts, trucking—except among rapidly moving machines—obviously not requiring good vision.

Certain arbitrary limits were established as the dividing lines between these classifications. For example, for Class V-1 the applicant's eyesight must measure 100/100 either without correction, or with correcting lenses. For Class V-2 the applicant's eyesight must measure 60/100; and for Class V-3, 20/100. In grading eyesight, the vision of the poorer eye is taken as determining the man's class.

*B. Physique*

All jobs in the plant were divided into three classes with three subdivisions each, according to their requirements of strength, height and weight, as follows:

Class P-1. Requires much heavy lifting or unusually heavy loads.

1-a. Too active for heavy man

1-b. Especially fit for heavy man

1-c. Tall man has advantage

Class P-2. Requires only occasional heavy lifting.

2-a. Too active for heavy man

2-b. Especially fit for heavy man

2-c. Tall man has advantage

Class P-3. Light work, with no heavy lifting.

3-a. Too active for heavy man

3-b. Especially fit for heavy man

3-c. Tall man has advantage

As in the case of eyesight classifications, arbitrary limits were established for the dividing lines between these classifications. These limits are necessarily tentative, and will become more accurate as data are accumulated through the analysis of accident and efficiency records.

*C. Special hazards*

Certain jobs are attended by unfavorable conditions such as heat, dust, dampness, or necessity for heavy lifting. Wherever such conditions exist a special note describing, as exactly as possible, the unfavorable condition surrounding the job is made a part of the job specification, so that when employment manager and examining physician are considering an applicant for this job, they may have clearly in mind the conditions under which the work must be done.

HOW PHYSICAL STANDARDS ARE USED

In the employment office and on the desk of the examining physician there is a complete set of job specifications, on each of which is shown in code the visual and physical standards. When the physician accepts an applicant with certain restrictions as to the kind of work upon which he may be employed, a note is made of this fact upon the employment record and also a memo-

F617A SM 2-25
THE WHITE MOTOR COMPANY

SPECIFICATIONS FOR Riveting Gang: Bucker Up. 5 JOB NO. 456

LOCATION ERECTION Frame Assembly 412-P

DESCRIPTION OF DUTIES

Works under supervision of Riveter.

Relationship: Similar to riveter. The job might be called riveter's helper.

Responsibility: Property.

Tools: Company, Bucking up bars of different styles, wrenches, bucking up stands, and gloves.

Materials: Rivets and frames.

Holds bucking up bar against head of hot rivet after it is inserted in hole. Applies pressure to bar in order that blows from pneumatic hammer against rivet will be effective. Actually works as riveter using power hammer when a change of position would be inconvenient for riveter.

TIME REQUIRED FOR TRAINING

Inexperienced, 1/30 mo.
Experienced, 1/30 mo.
Promoted, 0 mo.

REASON FOR EXITS Work hard and monotonous.

REMARKS

CONDITIONS OF WORK

| | | | |
|---|---|---|---|
| Indoors | Medium (Speed) | Struck (by bar or frame) | Dirty |
| Heavy | Standing | | Coarse |
| | Sitting | | Routine |
| | Stooping | | |

HOURS 7:00 to 3:30 less 30 min.

PROMOTION FROM Passer and Heater. RANGE 3-4-5

PROMOTION TO Riveter.

REQUIREMENTS M. Strength. V 2

AGE 22 to 40 SCHOOLING N. P-1A

PERSONAL QUALITIES

JOB EXPERIENCE Desirable: Riveting Gang Bucker Up on boiler or bridge work (in shop).

FIG. 1

FAP 3163

FS64A 6M 5 33
THE WHITE MOTOR COMPANY

# PHYSICAL EXAMINATION

DATE _____ DEPT. _____ JOB No. _____

NAME _____ ADDRESS _____ AGE _____ WT. _____ HT. _____ M OR S _____ M OR F _____

| | | | |
|---|---|---|---|
| UPPER RESPIRATORY | EARS | | |
| | NOSE | | |
| | TEETH | | |
| | TONSILS | | |
| | PHARYNX | | |
| LOWER RESPIRATORY | BRONCHIAL TUBES | | |
| | LUNGS | | |
| CIRCULATORY SYSTEM | B. P. SYST. | DIAS | PULSE |
| NERVOUS SYSTEM | | | |
| GENITO URINARY ING. CANALS | | | |
| EXTREMITIES | ARMS—HANDS | | |
| | LEGS—FEET | | |
| SKIN | | | |
| EYES | CORNEA | O. D. | O. S. |
| OTHER CONDITIONS | | | |
| HISTORY OF ILLNESS, INJURIES, OPERATIONS | | | |

| | | | |
|---|---|---|---|
| ACCEPTED | | RECALL FOR OB. | |
| REJECTED | | LIMITED SERVICE | |

| CLASS | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| PHYSIQUE | | | | |
| MENTAL | | | | |
| EYES | | | | |

| DEFECTS | | | AVOID EXPOSURE TO |
|---|---|---|---|
| U. R | | | LD. |
| L. R. | | | HT. |
| C. S. | | | DT |
| N. S | | | OL. |
| G. U. I. | | | GS. |
| SKN. | | | WT. |
| EXT. | | | MCHY. |
| O. C. | | | STR. |

150

FIG. 2

randum to that effect is sent to the foreman. This serves as a warning to prevent the subsequent transfer of this employee to a class of work for which he is not qualified. The employment department will not approve the transfer of an employee who is accepted with restrictions, without first referring the case to the examining physician.

*Follow-up by medical department*

In the case of all employees who are accepted conditionally, a follow-up file is maintained in the medical department, which operates to recall the employee for further observation by the physician at some future date specified at the time the employee is accepted. In this way the physician may make sure that the work on which the employee has been engaged is in no way detrimental to his health and that whatever physical disability he had when he was employed is not aggravated by the work he is doing.

*Forms used*

Figure 1 is a typical job specification. The symbols representing the physical standards for the job are found in the lower right hand corner of the form.

Figure 2 is a form used by the examining physician to report to the employment office and the foreman the physical qualifications of an applicant. Spaces are provided to indicate the type of physical defect which has been found and also the kind of work upon which this applicant should not be employed. Any marks in these spaces serve as a warning to the employment office that the applicant can be used only for restricted service, and the employment record is marked accordingly. Space is also provided to indicate the approximate date at which the physician wishes to re-examine the employee in case he is accepted under observation.

EXPERIENCE OF ONE LARGE INDUSTRIAL PLANT

Following is a classification of the physical defects found in applicants for shop jobs in a plant employing 4000 workers. This is in addition to those who were rejected at first sight by the employment interviewer because of obvious physical shortcomings.

*Results of Physical Examinations of New Applicants*

| | REJECTIONS | OBSERVATION CASES | | |
|---|---|---|---|---|
| | | Not released | Released | Quit |
| Hernia—lax inguinal rings | 114 | 31 | 19 | 12 |
| Defective Eyesight | 48 | 18 | 2 | 6 |
| Heart Conditions: | | | | |
| Hypertension | | | | |
| Arteriosclerosis | 29 | 130 | 77 | 34 |
| Valvular disease | | | | |
| Deformities: | | | | |
| Congenital | | | | |
| Old injuries | 10 | 2 | 3 | |
| Disease | | | | |
| Chest conditions: | | | | |
| Tuberculosis | | | | |
| Chronic bronchitis | 14 | 17 | 6 | 6 |
| Asthma | | | | |
| Skin disease (Transmissible and non-transmissible) | 4 | 2 | 1 | |
| Goitre | 5 | 11 | | |
| Kidney conditions: | | | | |
| 1. Nephritis | | | | |
| 2. Albuminuria | 3 | 48 | 36 | 21 |
| Diabetes (glycosuria) | 2 | 2 | 4 | 1 |
| Mentally deficient | 3 | | | |
| Syphilis | 3 | 2 | 2 | |
| Varicose veins | 2 | 3 | 2 | |
| Defective hearing | 1 | 5 | 1 | |
| Cirrhosis of liver | 1 | | | |
| Hydrocele | 1 | 1 | | |
| Gonorrhea | 1 | | | |
| Lead poisoning | 1 | | | |
| Tumors | | 2 | | |
| Throat conditions | | 4 | 1 | 2 |
| Postural defects | | 5 | 1 | |
| Liability to oil dermatitis | | 11 | 23 | 20 |
| Dental defects | | 6 | 1 | 2 |
| Nervous disease | | 1 | | |

*Summary*

| | |
|---|---|
| Total examinations | 4010 |
| Unfit for employment | 5.3 per cent |
| Requiring observation for defects | 14.8 per cent |

*Disabilities and rejections per thousand examined*

| | TOTAL DISABILITIES PER THOUSAND | TOTAL REJECTED PER THOUSAND |
|---|---|---|
| Hernia and incipient hernia | 44.0 | 28.5 |
| Defective eyesight | 18.5 | 12.0 |
| Circulatory diseases | 67.5 | 7.5 |
| Deformities | 3.75 | 2.5 |
| Chest conditions | 10.75 | 3.5 |
| All other causes | 61.75 | 6.5 |

# Validating the Questionnaire Method

By Herbert A. Toops, *Institute of Educational Research, Teachers College, Columbia University*

IN DETERMINING the success of trade school instruction, it is necessary to determine the success or failure of its graduates. The questionnaire method is often the only feasible method on the grounds of cost and on account of the inaccessibility of graduates. And yet the questionnaire method is not infrequently held in disrepute by investigators. This is probably largely due to:

1. The fact that in but a few investigations is there more than a fraction of the graduates who reply to the questionnaires sent them, and thus any results secured are often subject to question as to whether the sampling obtained from those who do return the questionnaires is an adequate measure of the entire group.

2. There is a current distrust of the results received from the written question as opposed to its (only) alternative, the oral question.

In a recent survey the second of the above two objections was largely overcome by giving such special attention to the wording and mechanical arrangement of the questions, and by putting the preliminary form through seven revisions before mimeographing the form for distribution, that the results obtained from each question were undoubtedly almost the same as would have been obtained from verbal questioning. The methods pursued will be reserved for another article.

This article will attempt to describe in detail the methods pursued in this survey to practically overcome the force of the first, or most important, of the common objections to the questionnaire method.

In this case the time and money cost of individual follow-up made its use impossible. Questionnaires were sent out to the graduates of a number of trade courses. In one course it was particularly essential that the returns received should be a valid sampling of the entire number of graduates. By using the methods described below, 93 per cent of the graduates who presumably received the questionnaires ultimately returned them. As the returns from successive follow-ups came in, the cost per reply received decreased from an initial cost of $2.77 each to a final cost per reply of 68 cents.

On January 5, a three-page 37-question questionnaire and accompanying letter (No. 0, Appendix) was sent to the first 178 graduates on the alphabetical list of graduates. On June 30, not quite six months later, the last questionnaire was received.

Of the 178 questionnaires sent, 63 were returned by the post office within

the first two weeks with the notation, "Moved, left no address." Ultimately 19 more of the follow-up letters were returned with the same notation, thus making 82 (46 per cent) in all that the postoffice was unable to locate. There thus remains 96, or 54 per cent of the original 178, who presumably received the original questionnaire and all subsequent follow-up letters in induced to reply, the returns would be fully as adequate as a single personal visit at each graduate's former address. Even a lower return would be fully as good, since on personal visits there is always a fair per cent "away from home."

The returns by half weeks throughout the six months are shown in figure 1. In this chart, the first half

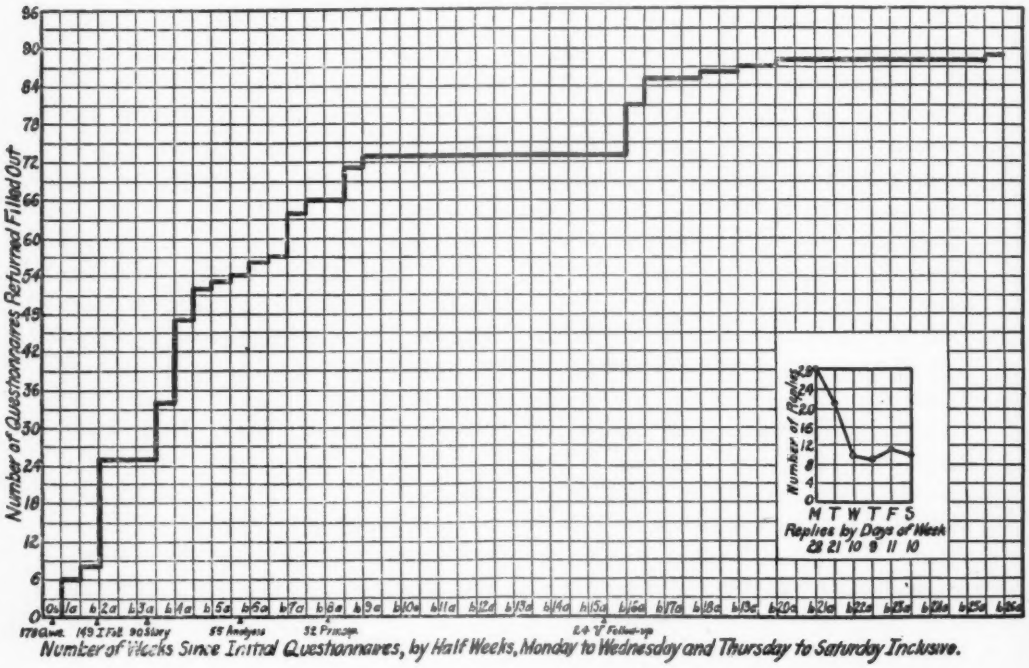
Number of Questionnaires Returned Filled Out
Number of Weeks Since Initial Questionnaires, by Half Weeks, Monday to Wednesday and Thursday to Saturday Inclusive.
Number of Replies
M T W T F S
Replies by Days of Week
28 21 10 9 11 10

FIG. 1. CUMULATIVE GRAPH OF THE RETURNS FROM SUCCESSIVE FOLLOW-UPS

case they had not already replied before a given follow-up letter was sent. That the belief that the 96 received all the follow-ups was not unfounded is shown by the fact that only 7 of the 96 ultimately failed to return the questionnaires. From this 7, no return of any kind was received. If then, all of the 96 who presumably received the questionnaire could be

of the week is indicated by the subscript letter $_a$, thus $7_a$ means the returns received for Monday, Tuesday and Wednesday of the seventh week after the initial questionnaires were sent, while $7_b$ means the returns for the corresponding last three days of the same week. The returns are given in cumulative fashion, that is the total number of replies received up to the

end of the period under consideration; thus, at the end of the sixth week, $6_b$, 57 returns had been received to date. The goal sought is to make the curve reach the top of the chart, to receive returns from the 96 who presumably received the questionnaires. Along the base line the little triangles with their legends show the time at which the various follow-up letters were sent. The most effective follow-ups are shown by a rapid rise of the curve immediately after the follow-up was sent.

The small inset on this chart shows the result of the count of the total 89 returned questionnaires according to the day of the week on which they were received. This curve shows the highest returns received on Monday and Tuesday, and only about half so many or less on each of the other four days of the week. The significance of this will be discussed later.

The original questionnaire and accompanying letter was sent on Friday of the zero week to 178 graduates of the school.

By Saturday of the first week only 8 returns had been received to date, and thus it began to look as if the attempt to obtain data by the questionnaire method was likely to fail. On this day the first follow-up letter was sent to 149 persons who had not yet been heard from and who had presumably been located by the postoffice on the former occasion. The response to the first follow-up letter was immediate and marked. In three days 17 more returns had been received making 25 in all. But the returns suddenly stopped.

A second follow-up, in the shape of a moralistic story, was sent on Tuesday of the third week to 90 still unheard from. The returns were most gratifying, 22 being received in the next week and a half. Since after that the daily returns had begun to fall off appreciably, it was decided that another follow-up was in order.

Accordingly the third follow-up, an analysis of objections to replying, was sent on Friday of the fifth week to the 55 yet unheard from. Strangely (as it then seemed) no marked effect of this letter was received during the following week, but on the second week following 9 returns were received.

No reply being received on Saturday of that week, the fourth follow-up, a letter signed by the principal of the school, was sent on Monday of the eighth week to the 32 yet unheard from. Five replies were received during the latter half of the week and two during the first half of the following week, after which no replies were received for six weeks during which time no further letters were sent. On the graph this period is indicated by the long horizontal stretch of the curve between the ninth and fifteenth weeks inclusive.

At the beginning of the ninth week, with 71 replies on hand, it was decided to delay no longer in working up the results. The account then stood:

| | |
|---|---|
| Returned by the postoffice..... | 81 |
| Replies received filled out..... | 71 |
| Not yet heard from..... | 26 |
| Total number of questionnaires... | 178 |

Thus the results were computed on the basis of the above, in which, 71/97

= 73 per cent, of those who had at that time presumably received the questionnaires, had returned them. This figure compares very favorably with the best returns commonly received on questionnaires. Two more questionnaires were received during the week but too late to include in the returns; two of the papers were only partly filled out and had to be thrown out, so that the computations for the survey were based on 69 returned questionnaires.

In the meantime, the daily returns, which so far had been merely kept on a sheet of paper, were graphed. The writer had become interested in the possibility of obtaining 100 per cent of returns, or at least making an attempt to learn why the 24 persons who had not yet replied had not done so, and whether they represented a biased sampling of the entire group.

On Wednesday of the fifteenth week a compromise letter was sent to the 24 persons yet unheard from, offering to stop sending the recipients any more letters in case they would reply to a selected "four most important" ones of the questions. The questions were very carefully selected from the 37 to best reveal whether the school had functioned successfully in their case.

Beginning with the following Monday, there were 12 returns during the week. One questionnaire was received during each of the eighteenth, nineteenth and twentieth weeks, and finally one in the twenty-sixth week—making 89 in all, or returns from 93 per cent of the 96 persons who had at that time presumably received all the material sent them. The account then stood thus:

| | *no.* | *per cent* |
|---|---|---|
| Returned by the postoffice | 82 | 46 |
| Replies received filled out | 89 | 50 |
| Not yet heard from | 7 | 4 |
| Total number of questionnaires | 178 | 100 |

The returns, 89, is 93 per cent of the 96 who presumably received the material sent them. It would seem as though the proper additional follow-up might have secured returns from a part if not all of the remaining seven. If a night telegram would have secured the result it would be a cheap final follow-up.

As a result of the postscript to the fifth follow-up letter, or else due to the cumulative effect of the entire follow-up series, some half dozen of the 16 who replied to the fifth follow-up sent in both the long and the abbreviated form of the questionnaire!

The inclusion of the returns received after the 71st return left the most important percentages and averages practically unchanged showing that the selection at this stage was not a biased selection.

Those sending both the long and short questionnaire consisted largely of men who had got no position. On the other hand, those who returned only the abbreviated questionnaire included among their number several who had prospered very well in the occupation, and who may really have been "too busy to answer" the long questionnaire. At any rate, this disclosure makes evident the importance of having as few questions to answer

as is consistent with the absolutely essential facts to be secured. Sixteen returns were received from the abbreviated questionnaire as compared with 7 on the immediately previous fourth follow-up and 12 for its preceding or third, follow-up.

As evidence of the success of a well organized follow-up campaign, the last ten replies received may be worth many times as much as the first ten received. The investigator should not, however, let his personal elation outweigh the fact that if the replies are approximately a random sampling of the group he wishes to measure the value of an increased number of returns is dependent upon the square root of the number of cases rather than upon the number of returns directly, so that the last ten replies are on this basis worth much less then the first ten. However, until a number of conclusive experiments are undertaken to determine whether selection does ordinarily or ever take place in the early replies, the goal of 100 per cent of returns is a desirable one, and the use of follow-up letters a necessity.

Better still is the method of plotting daily returns from the successive follow-up letters by the use of control-board methods and determining therefrom the proper time to send the follow-ups, and the time when they may be discontinued. One should compute daily the cumulative averages or percentages on the four or five most significant and essential questions of the questionnaire. When these significant averages and percentages vary but little from week to week, one has some reasonable assurance that the follow-up has proceeded about far enough. These percentages and averages may be plotted on a chart similar to Fig. 1, made out on the basis of days preferably, which should contain in addition for each day, and for every follow-up letter: number of letters sent, number of replies received, cumulative number of replies received, number yet unheard from, presumable number of recipients. Whenever the curve of cumulative replies received becomes horizontal or approximately horizontal, it is time to send an additional follow-up letter. Other things being equal, it probably would be better to alternate long follow-ups with short ones. In this case, a follow-up in brief form, appealing more to the reason than to the emotions, might well have succeeded the long second follow-up, the story. Such a possible one is given in the appendix.

An analysis of the original returns by days, from which the insert of figure 1, was later constructed, may throw some light on the best time of the week to send a questionnaire. Fifty-five per cent of the 89 returns came during the first two days of the week, on Mondays and Tuesdays. Sixty-five per cent came on the first three days of the week. Lacking one, as many replies came in on Monday and Tuesday as in the remaining four days of the week. It would seem that probably the weekend holiday is the time when recipients fill out questionnaires and answer accumulated correspondence which is then mailed upon Sunday or Monday, arriving on Monday or Tuesday. Accordingly the questionnaire should not arrive at the recipient's home so early in the week

that he will lay it aside and forget it, or throw it in the waste basket for lack of time to answer it immediately, but rather should arrive about Friday night or Saturday morning, whereupon it may receive immediate attention.

The third follow-up letter analysis of objections, was mailed on Friday evening and so undoubtedly reached but few for attention over the week end. It secured but 12 replies, three of which arrived during the following week, while seven replies arrived on Tuesday and Wednesday alone of the second week. Again, the fourth follow-up, principal's letter, was sent on Monday. Three replies came on Thursday, 2 on Saturday, 1 each the following Tuesday and Wednesday. The failure of this letter to secure replies may be partly due to its arriving too early in the week. Tuesday is probably also too early in the week to send local questionnaires. The second follow-up, story, was sent on Tuesday. Nine replies were received on Friday and Saturday (this is the only letter which received many replies returned on the last two days of the week) while 13 were received on Monday, Tuesday and Wednesday of the following week. For local questionnaires, Wednesday night to Thursday morning is probably a better mailing time. The fifth follow-up compromise, was sent on Wednesday. No replies were received until the following Monday when 6 were received, and one or two daily thereafter throughout the week. A well worded hint might be included in one or more of the follow-up letters to the effect that the recipient might find the time to answer the questions over Saturday and Sunday.

The 82 persons (46 per cent) of the original 178 whom the postoffice could not locate should be investigated by personal or other follow-up to determine whether they are a biased sampling. In New York, where apartment house life is the rule and where apartment house renters, elevator tenders and janitors change with the shifting of the wind, it would be desirable to collect from each student when enrolling at the school the name of the student's landlord and his apartment number. Then, when communications are addressed to Mr. John Doe, Care of Mr. Richard Roe, Apartment 38, 5095 Williams Street, the communication has a chance of being redirected by Mr. Richard Roe, or by the present renter of apartment 38, in case the new janitor or elevator tender is unacquainted with the former student, John Doe.

### THE COST OF RETURNS

By knowing the cost of materials, labor and postage, we are in a position to estimate the cost of the follow-ups. In all of the following estimates, the salary of the supervisor of the clerical help and designer of the questionnaire and follow-up letters is omitted; all other expenses are included.

The questionnaires were mimeographed while all the letters were multigraphed. Mimeographing is estimated at $1.08 for the first 100 pages and 10 cents for each additional hundred, the above including stencils, ink, paper, labor of cutting stencil, and running off the finished sheets of the questionnaire. Multigraphing is esti-

mated at 5 cents per line for the first hundred copies of a given page and 25 cents for each additional hundred, including cost of letterhead paper, labor of composition and running off the finished copies. With a very large mailing list the per letter cost of both mimeographing and multigraphing would be materially reduced. The per letter cost of postage cannot be reduced. In all letters, even though six were sent, a stamped self-addressed multigraphed return envelope was included. This seemed psychologically wiser than merely sending a return envelope. At any rate, return postage is but a small item in the total cost when one aims at 100 per cent of returns. The clerical help involved in assembling and mailing the questionnaires and letters cannot be materially reduced unless one has so large a quantity to send that mailing machines and other efficiency devices may be used to advantage. The labor cost is based on an estimate of a clerk's being able to address, fold, stamp, enclose and post 15 letters per hour at a wage of 60 cents per hour, and to assemble, clip and fold forty 3-page questionnaires in an hour. Thus letters alone will cost four cents each for labor, and when questionnaires are included in addition an extra 1½ cents for these. The labor cost is the largest element in the total cost, closely followed by postage, while materials cost only about half as much as either of the other two.

In all, 528 letters were sent at a total cost of $60.23 for materials, labor, postage, at an average cost of 11.4 cents per letter. From these 528 letters, 89 replies were received, or an average of one reply for every 5.9 letters, at an average cost of 68 cents per reply. Table 1 shows a complete analysis of the returns and of costs.

The cost per reply received naturally decreased as the number of replies received became greater. This is due to two causes: (1) in later follow-ups one need not send follow-up letters to those whom the postoffice is unable to locate in earlier letters; (2) due to the cumulative psychological effect of repeated follow-ups the later follow-ups are more effective in pulling replies than the earlier ones, no matter whether we compute the effectiveness by taking the percent which the replies are of the number of letters sent, or the per cent which the replies are of the number presumably received, as shown in table 2.

The curve showing decreasing cost per reply received as later follow-ups are employed is shown in figure 2. In one sense it is economical to aspire to 100 per cent of returns from presumable recipients.

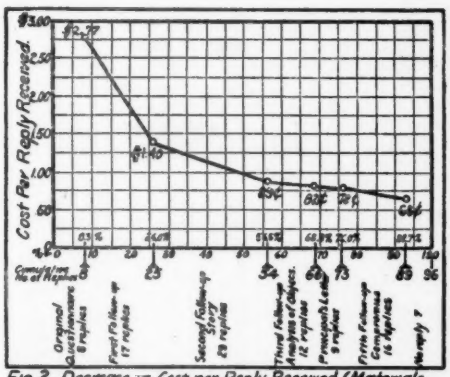


Fig. 2. Decrease in Cost per Reply Received (Materials and Clerical Help) As Successive Follow-ups Are Sent.

TABLE 1

*Allocation to the several letters of the cost of replies received*

| MATERIALS SENT | NUMBER OF WORDS | NUMBER OF LINES | DAY OF THE WEEK SENT | REPLIES RECEIVED ON MODAL DAY | NUMBER OF MATERIAL SENT OUT | CUMULATIVE NUMBER RETURNED BY POST OFFICE | CUMULATIVE PRESUMABLE NUMBER OF RECIPIENTS OF MATERIAL | REPLIES RECEIVED FROM THIS MATERIAL | CUMULATIVE NUMBER OF REPLIES RECEIVED | COST | | | | COST PER REPLY OF THIS MATERIAL (m/i) | TOTAL CUMULATIVE COST (Em) | TOTAL CUMULATIVE COST PER REPLY | CUMULATIVE PER CENT WHICH REPLIES ARE OF 96 PRESUMABLY RECEIVED (100 i/96) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Material and labor of preparation | Clerical labor in assembling and mailing | Postage | Total (j + k + l) | | | | |
| Column | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q |
| Initial questionnaires | | | | 3 | 178 | | | | | $4.00 | $2.65 | | | | | | |
| Accompanying letter | 159 | 20 | Fri. | Following Mon. | 178 | 21 | 157 | 8 | 8 | 1.25 | 7.12 | $7.12 | $22.14 | $2.77 | $22.14 | $2.77 | 8.3 |
| First follow-up letter | 82 | 14 | Sat. | 7 Following Mon. | 149 | 63 | 115 | 17 | 25 | 0.95 | 5.96 | 5.96 | 12.87 | 0.76 | 35.01 | 1.40 | 26.0 |
| Replenishing questionnaires | | | | 9 | 90 | | | | | * | 0.90 | | | | | | |
| Second follow-up letter. Story | 474 | 63 | Tues. | Following Mon. | 90 | 69 | 109 | 29 | 54 | 3.15 | 3.60 | 5.40 | 13.05 | 0.45 | 48.06 | 0.89 | 56.3 |
| Third follow-up analysis of objections | 493 | 48 | Fri. | 6 Tues. a week later | 55 | 79 | 99 | 12 | 66 | 1.45 | 2.20 | 2.20 | 5.85 | 0.49 | 53.91 | 0.82 | 68.8 |
| Fourth follow-up principal's letter | 93 | 15 | Mon. | 3 Thurs. following | 32 | 81 | 97 | 7 | 73 | 0.50 | 1.28 | 1.28 | 3.06 | 0.44 | 56.97 | 0.78 | 76.0 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Replenishing questionnaires..... | | | | 6 | 24 | | | | | * | 0.36 | | | | | | |
| Fifth follow-up compromise..... | 159 | 19 | Wed. | Following Mon. | 24 | 82 | 96 | 16 | 89 | 0.50 | 0.96 | 1.44 | 3.26 | 0.20 | 60.23 | 0.68 | 92.7 |
| Still outstanding..... | | | | | 7 | | | Total | | $11.80 | $25.03 | $23.40 | $60.23 | | | | |

* The cost of mimeographing 350 copies of the questionnaire (approximately twice the number needed in the original letters) is charged to the initial cost of the 178 questionnaires. The cost of assembling and clipping later questionnaires is charged to the follow-up in which they were used. The extra 172 copies, run off in the original group cost but 52 cents at the rate of 30 cents per hundred of the 3-page questionnaire, but would cost much more if required to be run off later. These thus do not materially affect the cost of the initial questionnaires while they effect a considerable saving if used later on in the course of the follow-up.

TABLE 2

*Table showing the greater effectiveness in pulling power of later letters as vs. earlier ones*

| | NUMBER SENT | NUMBER OF PRESUMABLE RECIPIENTS | NUMBER OF REPLIES | PER CENT WHICH COL. C IS OF COL. B | PER CENT WHICH COL. C IS OF COL. A |
|---|---|---|---|---|---|
| Initial questionnaire..... | 178 | 157 | 8 | 5.1 | 4.5 |
| I Follow-up..... | 149 | 107 | 17 | 15.9 | 11.4 |
| II Follow-up..... | 90 | 84 | 29 | 34.5 | 32.2 |
| III Follow-up..... | 55 | 45 | 12 | 26.7 | 21.8 |
| IV Follow-up..... | 32 | 30 | 7 | 23.3 | 21.9 |
| V Follow-up..... | 24 | 23 | 16 | 69.6 | 66.7 |
| Column..... | a | b | c | d=c/b.100 | e=c/a.100 |

## APPENDIX

### LETTER ACCOMPANYING THE INITIAL QUESTIONNAIRE, FOLLOW-UP LETTERS USED, AND A SUGGESTED ADDITIONAL FOLLOW-UP LETTER

No. 0. *Accompanying Letter.* 178 sent, together with questionnaires.

TEACHERS COLLEGE

COLUMBIA UNIVERSITY

NEW YORK

Dear Sir:-

We are enclosing a questionnaire from the Bureau of Educational Research of Teachers College, Columbia University.

You will note that most of the questions can be answered by "yes" or "no" or by two or three words. Will you kindly help us by filling this out and returning it to us at once?

The purpose of the survey is to find out in what ways the educational work of the -------- can be improved and made more valuable to the men who enroll. We are not anxious either to approve or condemn the work as it has been done. We desire to find out facts and if possible to enable the men who enter the courses to get as much as possible out of them. We are particularly anxious to learn to what extent you have been prepared to secure promotions or better positions because of the work in the -------- courses.

Yours very truly,

20 lines, (Signature in ink)

159 words. Herbert A. Toops.

No. I. *First Follow-up Letter.* 149 sent.

TEACHERS COLLEGE

COLUMBIA UNIVERSITY

NEW YORK

Dear Sir:-

A questionnaire was sent you on January 6th, from our Bureau of Educational Research. I presume you have laid it aside, thinking you would attend to it at some time which has not yet come.

We are very anxious to have this information. Will you not at once look up the document and fill it out and return it? You will find that it will not take much of your time to do this.

Yours very truly,

14 lines, (Signature in ink)

82 words. Herbert A. Toops.

No. II. *Second Follow-up Letter. Story.* 90 sent, together with replenishing questionnaire.

TEACHERS COLLEGE

COLUMBIA UNIVERSITY

NEW YORK

Dear Sir:-

We find your name among the few graduates of the -------- School of -------- who have not returned the questionnaire sent you recently. A new questionnaire is herewith enclosed, in case you have mislaid the other one or if it has been lost in the mail. We hope the following short story will encourage you to answer this questionnaire at once.

The Merchant's Dinner

In France before the war it was the custom on a certain holiday for thirty jovial tradesmen to meet at the home of a popular merchant. They foregathered to renew friendships, to have speeches, and to make merry with wine and song. But a sad day came with the advent of the war. The good merchant's stock of wine was exhausted and, on account of business reverses, he had not the means to purchase more. Great were his misgivings as the holiday approached, for he could not think of the feast without the customary wine. The tradesmen all shook their heads sadly, until one made the bright suggestion that each procure a bottle of wine, to replenish the good merchant's cask with thirty bottles.

The holiday came. There was no lack of merriment and this served somewhat to dispel the host's fears. Unnoticed by him, the tradesmen one by one proceeded to the cellar, each withdrawing a small bottle from beneath his cloak, emptying the contents into the cask, and returning to the company unnoticed. While the feast was at its height, the merchant made the sad announcement that his wine cask was empty. One of the guests spoke up: "Good friend, perhaps the last drop has not been drawn. Let us at least see the color of a good glass of wine."

The merchant went down to his cellar and was astonished beyond measure when, upon turning the faucet, his pitcher was quickly filled to the brim. He hastened up the dim stairway to his guests. When lo and behold! In place of the golden liquid which he expected to see, there was nothing but water in the pitcher. It seems that every man had said to himself; "Among so many bottles, it will not matter if I fail to furnish good

wine. I will fill my bottle with water, and no one will ever know the difference."

With so many graduates of the -------- School of --------, you may feel that whether or not you answer the questionnaire will make but little difference. But, as the above story so forcibly shows, it is only when every man feels responsible for a big undertaking that the undertaking succeeds. We hope to have one hundred per cent of returned questionnaires. Will you please cooperate by sitting down now and filling out the answers to the questions?

Very sincerely yours,

63 lines, 2 pages (Signature in ink)

474 words. Herbert A. Toops.

No. III. *Third Follow-up Letter. Analysis of Objections.* 55 sent.

TEACHERS COLLEGE

COLUMBIA UNIVERSITY

NEW YORK

Dear Sir:-

Do you know that the -------- -------- School on December 31, 1922, had enrolled 876 students since its beginning five years ago? Do you know that your name is on our list of 55 of the graduates who have not yet answered the questionnaire sent them recently? We have sent you three letters; none of them have been returned by the Post Office Department; consequently we can only assume that you must have received them. Why don't you answer?

We have tried to guess what must be your objections to answering. Please read the objections below and our answers. We hope these will answer your objections and that you will send in your reply at once.

No.1: "I HAVEN'T THE TIME."- We have so designed the questionnaire that most of the answers are "Yes" or "No." You will find that it will take but a few minutes to answer them.

No.2: "I DO NOT WISH TO GIVE INFORMATION REGARDING MY PERSONAL AFFAIRS."- You will note that the questionnaire does not ask for the amount of your present salary, nor for your religious preferences. We are not interested in knowing who is your present employer, so that you may omit that in case you do not want to give it, if you will be specific in regard to the kind of work you are doing. The results will be held absolutely confidential.

No.3: "I WILL NOT PROFIT BY THE ANSWERS WHICH I MAY GIVE."- Neither may you profit by giving your seat to a lady in the street car. The whole purpose of the survey is to enable us to devise and put into effect better methods of instruction. We want to know, for instance, whether former graduates are now working at -------, and whether they secured their own positions or were aided by the ------ School. Our results will help the next student who enrolls.

No.4: "I HAVE ONLY KICKS TO MAKE; I CANNOT RECOMMEND THE -------- COURSE."- If that is your reason, let's have it; and please go a little bit further and tell us why you have the kick. Perhaps we can have the cause of the grouch removed for the next student who comes along.

No.5: "I AM MAKING A SUCCESS. THE INSTITUTE WILL HAVE PLENTY OF REPLIES LIKE MINE, SO WHY SHOULD I SEND ONE?"- "Yes," that may be true; BUT, the Institute does not know it until it hears from you. If you have either kicks or recommendations for the -------- course, please send them in along with your questionnaire.

We cannot be sure that we have an accurate picture of what the school is doing until we have one hundred per cent of replies to our questionnaire. Only 55 more answers will give us this one hundred per cent. Will you please send in your questionnaire today?

Very sincerely yours,

48 lines, (Signature in ink)

493 words. Herbert A. Toops.

No. IV. *Fourth Follow-up Letter. Principal's Letter.* 32 sent.

THE ———— SCHOOL

NEW YORK

Dear Sir:-

I regret to find that you have not returned the questionnaire which was sent to you by the Institute of Educational Research of Teachers College. The purpose of this survey is to aid us in improving our educational system. They can only advise us as to the best step to pursue in our future work by basing their recommendations upon accurate information from all of our former graduates. May I personally ask you to help us by replying to this questionnaire?

Very sincerely yours,

15 lines, (Signature in ink)

93 words Principal of the ———— School

No. V. *Fifth Follow-up Letter. Compromise Letter.* 24 sent.

TEACHERS COLLEGE

COLUMBIA UNIVERSITY

NEW YORK

Dear Sir:-

We have at last come to the conclusion that you are either too busy or too disgusted

with the results of your course at the --------
School to send in an answer to our questionnaire.
The letters which we have sent you have not
been returned by the Post Office Department and
hence our assumption is that they must have
reached you. If either of these reasons apply
to you, we would greatly appreciate your
decision to make a "fifty-fifty" bargain with
us and we will call it "quits." If you will
answer the enclosed set of four questions and
return it to us in the stamped envelope, we
promise that we shall send you no more letters.

Very sincerely yours,

(Signature in ink)

Herbert A. Toops.

P.S. Perhaps you have time for the longer
questionnaire. We are sending another for your
convenience in case you have the time and the
inclination to fill out the longer one.

19 lines,
159 words.
Initial questionnaire and compromise four-question questionnaire enclosed.

No. XYZ. *Suggested Additional Follow-up Letter.* Its place of insertion in the above series is discussed in the text.

TEACHERS COLLEGE

COLUMBIA UNIVERSITY

NEW YORK

Dear Sir:-

To date we have sent you --- letters in an
attempt to get you to answer our questionnaire.
Each reply received so far has cost us an
average of --- cents each.

If you would send in your questionnaire at
once the money which we might spend in sending
other letters to you could be used in improving
other -------- courses. Ten minutes of your
time is worth ----- to us. By sending in your
questionnaire now you will be helping us

out at the rate of an $----- per hour expert. (At --- cents for ten minutes, an hour's time is worth to us 6 times --- = $---).

Is ten minutes of your time worth more than ----- to you? You will find plenty of time over Saturday and Sunday to answer it for us.

Very sincerely yours,

(Signature in ink)

Herbert A. Toops.

# News Notes

### A PLATFORM FOR INDUSTRIAL PEACE

"Collier's" have reprinted and distributed their "Platform for Industrial Peace," which includes a description of the methods used in building the Platform, the purpose of building it, a portion of the raw material from which it was formed, and the finished Platform.

The following paragraphs are part of an editorial which appeared in the November 18, 1922, issue of Collier's: "We must put an end to the stopping of service in every basic industry—whether by lockouts, strikes, or financial buccaneering. No group shall deny to the rest of us the right to live.

"We have got ourselves into the way of thinking that there is a real conflict between the parts of industry, and that the right to lockout, the right to strike, the right to take unearned profits, are fundamental and inalienable. Are they right? Are they fundamental? Are they more important than the right to carry a revolver in crowded streets?

"Our thinking is out of focus. We need a clearer, better-defined idea of what we are all about.

"A plan is needed, a new platform for all basic industries. No few men can make it. We must all get to work."

Included in the editorial was a tentative draft of the first plank, with a call for suggestions. Letters poured in from every part of America, and it was with these letters as a guide that new planks were added. The complete Platform follows:

"*Plank One.* SERVICE. The main working rule for those who engage in any basic business must be Service. The people, who maintain the market for all goods, energy, and skill, must have a continuous supply of every essential of life. Service may be defined as the successful effort continuously to keep up supply, raise quality, and reduce cost. In the long run profits and wages are earned and should be received by any of us only in the measure that we serve.

"*Plank Two.* REWARD. To serve the community a business must produce and distribute in such volume, and at fair prices, as to be able to take care of its own people. It must earn money to pay its workers wages which will support life in comfort. It must provide continuous work under healthful conditions, free the creative energies of all workers, and offer incentives to improvement of production.

"*Plank Three.* CAPITAL. To provide means by which its workers can earn their living, a business must have capital. This money and property must be hired, as workers are hired, and must be paid for, as work is paid for. Capital is saved by many, not looted by a few, and that service of saving must be rewarded. In the interest of workers and the people every basic business must earn its way, pay a return on needed capital, meet its debts when due, and build strongly for the future.

"*Plank Four.* MANAGEMENT. Earnings, through service, is the job of management. When a business does not pay fair wages for work and for capital, the fault is usually with management—in the factory, in the office, in sales, or in finance. If management is hampered by rules of government or labor, this is a condition which must be met and dealt with, not an excuse for failure. We must respect and reward the task and service of management.

"*Plank Five.* LEADERSHIP. Owners, and lenders, are usually responsible for management, whether good or bad, and must be the first to pay, in reduced earnings, the penalty for its mistakes. The public must not be asked to pay higher prices, nor

the workers to take lower wages, until all possible has been done to lower costs, better methods, stop gambling, improve merchandising, and thus increase earnings as based on service.

"*Plank Six.* OPERATION. Management must keep the business going, and not shut down to gamble in prices or wages. It must plan the entire business—financing, buying, manufacturing, and selling—so that goods pass from raw materials to the consumer continuously and at steady prices based on service. Management must work for higher quality and for a constantly better use of machines and men, a constantly better organization of the field and of the industry. It should never be allowed to combine when it ought to compete, nor forced to compete when it ought to combine.

"*Plank Seven.* WORK. Workers, whether or not in labor organizations, must help increase production and promote good feeling within the business served by each trade. All working rules should increase output, harmonize and educate fellow workers, and strengthen the human desire to serve. Such rules should make for the increasing of real wages earned by work done and service given on the job.

"*Plank Eight.* COÖPERATION. Workers and managers must know and have faith in one another. In each plant, district, or other unit of basic industry there should be a council, works committee, or other body of representatives, chosen by and from the workers in each such unit, to meet with the managers. These councils should confer on questions as to wages, working and business conditions and production. They should meet regularly and often, to prevent disputes, increase knowledge and build the fellowship of service.

"*Plank Nine.* KNOWLEDGE. The main facts as to the life, growth, and progress of every basic business, whose service is essential to all the people, must be made public and available to the rank and file of workers, and to the people who look to the industry for service, as well as to stockholders, directors, and managers. For example:

Balance sheet, principal items in detail, and explained
Routine report of expenses, profits, and operating facts
Funds held by labor, by employers, and by civic bodies concerned with the industry
Grievances, remedies proposed, and agreements
Wage and salary scales, hours of labor, and working rules

"*Plank Ten.* PEACE. The best arbitration is to need none. (See VII, VIII, and IX.) Government must not make arbitrations compulsory, deny the right to work or to stop work, or decided issues arbitrarily by injunction. Workers and managers in the units of basic industry should plan in advance to submit to arbitration any differences which their own councils may be unable to settle. These agreements should name the chosen arbitrators and provide for publication of the facts, so that appeal may be made to public opinion. Public opinion, informed and organized, is the one compelling force which will build justice and peace in all our basic industries."

### RECREATION

Mr. Eugene T. Lies, in an article published recently in the "American Federationist," described the purpose and work of the Play-ground and Recreation Association of America.

"A few facts about this organization may not be amiss. It is 17 years old and its purpose is, first, to awaken the public's realization of the need and value of constructive recreation in the life of everyone, especially in our strenuous time; second, to put at the disposal of the American people its ideas as to the best ways of getting the most out of recreation, physically, mentally, esthetically, and socially and, finally, to give out of its broad experience direct aid in working out practical ways and means for establishing leisure-time activities along all lines. Mr. Hugh Frayne, A. F. of L. representative in New York City, is a member of its Board of Directors."

It is the hope of the Association that a recreation program may be made an important part of the general city plan of every community in the land, in order that wholesome recreation may be permitted to satisfy the needs of those who have leisure time, but who have in the past found it necessary to turn for recreation to the field of commercialized amusements. Sitting on the side lines cannot very well build up physical and nervous resistance. The ultimate goal is an adequate provision of playgrounds, athletic fields, and community centers, and wider opportunities for all the people along the lines of music, dramatics, pageantry, and art.

The accomplishment of this goal will demand the enlistment of the thought and judgment of the members of every sort of organization and group. There must be utilized in this work schools, public buildings, churches, club rooms, lodge halls, and similar places.

"Now, the proposal of the Playground and Recreation Association of America is that organized labor be of one of the great agencies to take up this project in a vigorous way throughout the country. The Executive Council of the American Federation of Labor by its action in February has shown its sympathy with the plan. It remains for the state federations and local federations and councils to take the next steps. What is needed in the last analysis is initiative in setting the ball a-rolling in Xville, Yville, Zville and all other places where nothing or little has been done already. There is as yet no city or town anywhere that has a perfect community recreation program in operation.

"The Playground Association, with headquarters at 315 Fourth Avenue, New York City, is ready to go as far as possible in sending speakers to national and international unions, and state federation conventions, also to provide literature, give counsel by correspondence and furnish field service, under certain conditions, to aid in furthering actual local plans for formulation and execution of the kind of community recreation programs previously described.

"Here is a splendid means of enriching our common democracy, of making it more expressive, more colorful, more human, more satisfying."

### TRADE EXTENSION CLASSES FOR GIRLS

In a recent issue of the "Mental Hygiene Bulletin" there is announced the formation of a special branch in the Manhattan Trade School for Girls, which is conducted by the Department of Education of New York City and is intended primarily for graduates of elementary schools who wish to prepare for entrance into industry. This special branch is known as the Trade Extension Class, where girls who are not adjusted in their school work are given individual attention and special instruction in the light of their abilities. A total of sixty girls, including those enrolled in the Manhattan Trade School but who are slow in learning their trades, graduates of special classes in the public schools, and a few who have never attended either but who are retarded in their grades, are receiving training in the Extension Classes.

"Upon entrance, each girl is put into a test class to discover her special aptitudes. Most of the girls have been examined psychologically before entrance. In the test class it is usually found that the girl is better adapted to one line of work than to any of the others, and definite training is started along this particular line. The trades taught are handsewing, including millinery and dressmaking; machine sewing, with the use of hand and power machines; paste and glue work; and household activities, including care of rooms, laundering, and the like. The more simple processes of the skilled trades are taught."

This training is continued until a point is reached beyond which the student is apt to show no improvement. Employment is then secured for the girl, and reports of her work are sent in weekly by her employer. It is planned to give diplomas to those girls who have completed satisfactorily two years of training and employment.

### THE LABOUR QUESTION AND CZECHOSLOVAK INDUSTRY

Through the kindness of Mr. S. Spacek, technical attache of the Czechoslovak Legation, this publication[1] by Dr. Vaclav Verunac entitled The Labour Question and Czechoslovak Industry, has been brought to the attention of the Journal. A summary in English reports the following findings in regard to wages, relations between employer and employee, social insurance and unemployment, labour market and choice of occupations.

1. During the war a general rise in prices took place without any corresponding rise in wages. Towards the end of the war, and in 1919, wages were everywhere increased with a tendency to reach the pre-war level.

2. The real wages of unskilled workers rose by 1921 to slightly above pre-war level.

3. The difference between the wages of skilled and unskilled workers was diminished.

4. The real wages of brain workers are lower than before the war. The higher categories of them have smaller increase than the lower.

5. Women attained a relatively larger increase than men.

6. Also labourers in the country an increase larger than that attained by town workers.

From the technico-economic standpoint, we may summarize the relations between employer and employee as follows:

1. In the interests of economy, as many collective agreements embodying general principles, as possible, are to be recommended.

2. So far as the employees side is concerned, where tariff agreements exist today, they should be developed with facilities for advancement of individuals.

3. Where they do not exist, certain universal principles for determining wages should be fixed by agreement.

4. It is in the interests of economy and its smooth running that the wage-clauses of collective agreements should be determined on the basis of free consensus of opinion of the parties thereto, but where such agreements are made, they should be binding and a definite period of notice should be fixed and adhered to, in order to prevent strife.

5. The relation between employer and employee is to be regarded as a fundamental one, whilst the relation between the organization of the employers and the organization of the works as a secondary one of a higher order.

Interference by a third party, e.g. state, should take place only at the request of the parties concerned or if the interests of the community appear to be jeopardized. (Limitation of the policy of state intervention.)

6. In the effect of disputes, conciliatory means should first be tried, and after arbitration. These are, too, carefully to be distinguished. Arbitration can occur only if both parties are ready freely to accept the award, but recourse to arbitration should be compulsory if all other means have failed, and if economic loss for the community is to be anticipated from further postponement of settlement.

Arbitration must be, of course, quite impartial and appropriate to the volume of the industry."

The following are our views about strikes and lockouts.

a) Both strikes and lockouts are equally justifiable or unjustifiable, being opposite poles.

b) It is difficult to speak of a right to strike, but it is as difficult to oppose strike and lockout absolutely, because an absolute refutation of this right has no justification under present conditions. It must, therefore, be admitted, that under circumstances certain groups may resort to strike or lockout.

c) In view of the complex social order of today, it is necessary that all other avenues of settlement should be explored before recourse is had to those (e. g. organizations, conciliatory bodies, etc.).

d) If it is certain that the purpose of the strike is legal, then legal means of settlement should be first applied.

[1] Published by Masaryk Academy of Work, Prague, 1923.

But even though it be illegal, legal means should still be applied to avoid strike or lockout.

e) If legal means be found impossible, for any reason, the parties may seek remedy by means of strike or lockout; and it is the duty of the state, with its machinery, to accord due protection to the party which is in the right, if the purpose and cause of action of that party are justifiable.

f) There are circumstances and cases where recourse must not, on any account, be had to strike (e.g., leaving a boiler working, abandoning a furnace so that it would be ruined, and in all cases where human life or public interests are in question. I also disapprove of all political strikes.)

Strike, or lockout, is accordingly the last recourse bounded by the rights of the community, to which recourse can be had in the absence of other legal means of settlement sufficiently effective and prompt in action. As far as possible any sort of economic loss must be avoided especially if public interests are endangered. A strike should as a rule effect only him who has provoked it by his own action.

g) The relation between employer and employee must be free from all political influences.

h) It cannot be denied that in our factories conditions begin to settle down, that the strained relations of the time immediately following the revolution are disappearing; and it would be advantageous to introduce into factories a system of representative circles of workmen, with due attention to the degree of economic development; disregarding passions of the mob and political agitation. Collective agreements must lead to the democratization of industry.

From a technical-economical standpoint, the general principles to be observed are these.

1. The maximum aid depends upon the economic condition of industry.

2. I, as an organizer require an impartial unpolitical basis uniting health-accident, old age, incapability, and unemployment insurance; the centralized management as simple as possible, and the administration efficient. The change from present-day conditions to the form outlined above must be as gradual as possible, certain stages being prearranged with regard to the existing institutions (workers' sickness insurance, clerks' associations superannuation funds for clerks, friendly societies, etc.).

3. We can approach the stage by evolutionary stages, paying attention to the differences in the existing branches of social insurances.

4. Old age and incapacity insurance have to be dealt with first, being fully justified by experience and present conditions; the above stated principles must be observed even here.

5. The system must be so up-to-date as to combine both a repressive and preventive policy. (Social insurance should not only protect those affected, but should also prevent a decrease in healthy workers.)

Let us have all possible measures (necessary institutions should be provided) to prevent any lowering in the standard of health of the labour-bearer, and where it has occurred, to restore to them their economical capacity either in the same industry or in another, (special courses, sanatoria, etc.). Social prophylaxis is of primary importance.

6. All schemes should cover the largest possible number of individuals.

7. Social insurance should be obligatory, national, with representatives of both employers and employees in the management. Election rules must observe the rights of minorities and must have no political bases.

8. By means of laws for safeguarding of machinery and by proper instruction of workers, the dangers of industry should be minimized.

Unemployment can be coped with in future by:

1. A just and systematical organization of home and foreign production (compiling of statistics, reports, etc.).

2. Efficient, impartial system of distributing employment.

3. Application of technical-economical principles (choice of occupation, procuring facilities for that choice, and the application of the maxim 'the right man in the

right place'); also by an appropriate use of workers not only within the boundaries of the state (control of internal movement) but also with regard to other countries (control of emigration and immigration by virtue of certain international agreements).

4. Purposeful division of labour (civic and national supplies. seasonal labour).

5. Perfected and efficient insurance against enforced idleness, based on compulsory principles, rational insurance classified according to industries, jointly administered.

### INDUSTRIAL FATIGUE AND EFFICIENCY[2]

*A discussion by Dr. Reynold A. Spaeth*
*School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.*

It is particularly fortunate for American readers that Dr. Vernon has made available in simple, readable form the more important results of his wide experience with the "Health of Munition Workers' Committee" and the "Industrial Fatigue Research Board" of Great Britain. Throughout this volume we find precisely the same scientific, objective attitude toward an enormously complex problem which the author showed in his "Final Report of the Health of Munition Workers Committee."

Dr. Vernon believes that an objective, valid and quantitative method of measuring fatigue in industry will not be developed by laboratory procedure. In his opinion, performance tests, especially when the figures are for large groups of employees, constitute a practical measure of industrial fatigue. He warns against a too facile interpretation of output figures, however, appreciating the complication due to "psychical factors such as monotony and spurt." (p. 5).

He is less cautious when he states that "fatigue greatly increases sickness." Factory records undoubtedly show reduction of absenteeism ("sickness" being the simplest excuse) with a shortening of hours. Such a relation does not, however, prove that fatigue is a causative factor in disease. Spoilt work and accidents Dr. Vernon considers additional criteria of industrial fatigue.

Hourly and daily output curves are illustrated and analyzed. The author believes that "most manual labourers get into the habit of working at as steady a rate as possible." He then formulates a "Law of maximal production with minimum effort," which states that "experienced industrial workers unconsciously adopt habits of work which tend to the production of a maximum output with the minimum of effort." We are reminded at once of Taylor's classical experiments with pig-iron handlers which suggest that output may be astonishingly increased even in experienced industrial workers by an entirely artificial redistribution of rest and work spells. In this case, to be sure, as Dr. Vernon points out in a later chapter (p. 111) the men were spurred on by a promise of a 60 per cent higher wage if they gave maximum production. What the relative contributions of rest periods and wage incentive were to the increased production it is impossible to say.

"A much more important performance test than hourly output or daily output, is the weekly output of the manual labourer. The relation between weekly hours and production is lent a peculiar interest at this time by the recent decision of the United States Steel Corporation to retain the twelve hour day. An instructive graph (fig. 10, p. 36) shows that where shifts were reduced from twelve to eight hours the hourly output of steel melters employed on ten forty-ton open hearth steel furnaces

[2] By H. M. Vernon, M.D., London, George Rutledge and Sons, Ltd., 1921. We are particularly fortunate in being able to publish this discussion of Dr. Vernon's excellent book by Dr. Spaeth. The importance of the subject and the combination of comments by two specialists brings before us vividly the need for more careful experimentation as the basis for action in determining the length of the working day, rest periods, and efficiency standards. See also earlier review in this Journal, Vol. I, pp. 43–45, May 1922.—The Editors.

showed no improvement for two months. After thirteen months, it had risen eighteen per cent. The slow attaining of a higher level of production following a reduction of hours Dr. Vernon found to be quite universal. The simpler the operation, the shorter the time. In a more detailed discussion of the relation between output and hours of work, Dr. Vernon states that the probability of a maintained or increased output varies with the amount of human labor involved in the process. Where the pace is set by automatic machinery, production falls off with reduced hours; but where the "handling time" approaches 100 per cent, there appears in the production curve a definite optimal peak, depending upon a variety of physiological and psychological factors.

"From the point of view of maximum output, the hours of work of the manual labourer . . . . might be fixed at about seven per day. The hours of work of . . . . the engineer . . . . might be fixed at eight per day, whilst those of the operative who was dependent chiefly on machinery, such as the textile worker, might be fixed at nine or ten per day" (p. 81).

Dr. Vernon finds that the most economical and theoretically the soundest way of reducing industrial fatigue is by the introduction of rest periods. No general principle can be laid down to the duration and distribution of these rest periods but experiment will quickly demonstrate the optimum for each set of conditions. In the opinion of the reviewer objections from piece workers can probably best be overcome by a practical, competitive demonstration. Of Taylor's experiment with the pig-iron handlers Dr. Vernon speaks in no uncertain terms. As to Taylor's "law" for the handling of pig-iron by a "first-class" labourer, the author says (p. 112): "No such calculation is possible. The figures necessarily vary with different men." With this criticism we essentially agree, but the difficulty seems to us to be rather the complete absence of a quantitative measure of a "first-class labourer," The calculations for optimal rest and work distribution are clearly "possible" for any given individual but, without additional, individual data, are quite meaningless. The absence of any clear conception of experimental error and biological variation has been the outstanding defect of the entire Taylor school.

In the chapter on limitation of output, American readers will note with mingled emotions a quotation from Mr. Gompers to the effect that: "There has not been any restriction of output for over thirty years in America." Between 1886 and 1912 the yearly value of the goods produced by American and British Colonial workmen has steadily increased while in England it has fallen off remarkably. Dr. Vernon realizes the futility of questioning either employers or employees on the matter of deliberate limitation of output. Both are likely unconsciously to exaggerate the true stituation. He therefore made a study of output frequency distribution curves. When output is unrestricted these curves show a normal number of high and low frequencies. When the largest outputs are eliminated, the frequency curves become truncated on one side and the degree of truncation will afford a measure of the limitation practiced. Examples are given from the output figures of riveters in shipyards during the war. Deliberate limitation was by no means a constant phenomenon. It was not observed among apprentice riveters nor among caulkers working in the same yard with the riveters. Dr. Vernon distinguishes between intentional and general limitation of output. The latter is shown particularly in comparative studies of time and piece workers. For example, when the method of payment was changed from a time to a piece rate the relative output among riveters rose by seventy-eight per cent. This experience is universal in the industrial world.

The subject of limitation of output leads to a discussion of wage payment. Dr. Vernon feels that a straight piece rate without bonus or differential is the best system. He is immediately forced to admit, however, that rate-cutting by employers is the pernicious result of such a system. He argues, nevertheless, that

limitation of output is economically unsound because increased production ultimately lowers the cost of commodities. This is only a partial economic truth. With the elaborate machinery of price fixing and the elimination of competition by trade agreements, the consumer is at the mercy of the limitation of output as practiced by the producer. This phase of the problem of sabotage is perhaps properly not considered in Dr. Vernon's discussion. It nevertheless plays an important rôle in determining the attitude of Trade Union officials and employees toward enthusiastic Greater Production Campaigns.

In discussing lost time, Dr. Vernon states that if the total figure rises regularly above ten per cent there can be little doubt that some of the conditions of work need revision. His statistics likewise suggest that "no man ought to be allowed extra pay for overtime work unless he has put in almost a full week of normal working hours." Overtime, when used as a means of increasing wages frequently leads to absurd conditions. In one shipyard in 1900–1902 the riveters lost forty-three per cent of their normal working time but were permitted to put in six hours overtime at increased rates of pay. It would seem that such a situation is certainly as much an indication of faulty management as of an unduly low normal wage rate.

In some occupations (tile and pottery making, stone quarrying, etc.) excessive sickness and mortality are due very largely to the inhalation of dust. In other occupations involving industrial hazards, like lead and arsenic, illness and deaths are frequently due to the poisonous action of these drugs. Where no specific hazard is present it becomes enormously difficult to determine how far, if at all, sickness and mortality are due to fatigue. Dr. Vernon indicates a general prejudice in favor of the popular view that fatigue is a causative factor in facilitating bacterial infections, but, after reviewing the evidence in the case of the steel industry, he admits that "fatigue has comparatively little direct effect in increasing either sickness or mortality. The steel melters, who have occasional bursts of excessively exhausting work, may afford an exception to this dictum, but otherwise it appears that the effects of exposure to the weather, and of resting from work when in a state of perspiration, are more potent causes or sickness and death than the fatigue incident to hot and heavy work."

In order to test the validity of the claim, frequently made, that industrial accidents are directly correlated with fatigue, Dr. Vernon calculates the ratio between the hourly rate of accidents observed by the British Association Committee during the morning and afternoon spells. The accident frequency was practically no greater in the afternoon than in the morning. Nor was there any indication that accidents were more frequent when hours of work were reasonably long (ten per day) than when they were short (seven to nine per day). When hours were actually excessive (twelve as compared with ten per day in the same plant), women showed more than twice as many accidents on the longer spell. For men, however, the number of accidents was practically no greater on the long than on the shorter spell. Since excessively long hours are now exceptional in British industries, Dr. Vernon feels that "the evidence clearly negatives the hypothesis that fatigue is the chief factor in accident causation."

The "psychical state of the worker" is, in Dr. Vernon's opinion, the most important factor in accident causation. This suggestion is amplified by a comparison of low accident incidence among night workers with the higher rate among day workers. "When on night shift these workers usually got up three or four hours before they were due at the factory, and spent these hours in household work, in shopping, or amusement, and in having substantial meals. Hence they came on to work in a lively and sometimes an excited state, but they gradually calmed down during the course of the night, since they had only an unexhilarating breakfast and bed to look forward to. The day shift, on the other hand, got up as late as possible, almost always by artificial light, and after a hurried breakfast, arrived at

the factory in a lethargic and depressed condition. They brightened up gradually in the course of the morning, as they generally had some tea at about 9 a.m., and had their dinner break to look forward to. In consequence, their inattention and carelessness increased, and accidents multiplied accordingly." The author fails to agree with the report of the U. S. Public Health Service (Bulletin 106, 1920) where accidents were believed to be due to fatigue. Among several additional factors contributing to industrial fatigue, low temperature, artificial lighting and inexperience are the most significant. Cold appears to be more dangerous than bad lighting since the seasonal variation in fatal accidents shows a maximum in January—the coldest month—rather than in December—the darkest month.

In the chapter on the prevention of industrial accidents, Dr. Vernon presents convincing proof of the efficacy of developing the "safety habit of mind." The most striking evidence is from American sources, especially American railways. Through prolonged safety campaigns the Chicago and North Western reduced fatal accidents by 66 per cent, the Southern Pacific by 86 per cent.

In his discussion of factory conditions, Dr. Vernon lays great stress on the investigations by Dr. Leonard Hill on the stimulating influence of moving air. And he finds Mr. Gilbreth's ingenious suggestions on seating facilities both practical nad in harmony with physiological theory.

Progress in the further reduction and elimination of industrial fatigue depends, in Dr. Vernon's opinion, primarily upon the adoption of the experimental method. There is need also for more complete and more systematically kept factory statistics. Dr. Vernon feels hopeful as to the future of what we call personnel work in America, i.e., the bringing together of man and job by the rigorous application of physical, physiological and psychological tests for fitness. "We see, therefore, that real progress in investigations of industrial fatigue is dependent at every stage on the adoption of the experimental method, and a great step forward will be achieved when those concerned in industrial problems, employees as well as the employers, can be induced to realize the importance of experiment."

# Book Reviews

## INCENTIVES IN THE NEW INDUSTRIAL ORDER

*By John A. Hobson. 160 pp. 1922. Leonard Parson, London*

REVIEWED BY DAVID R. CRAIG

In this penetrating and stimulating study, Mr. Hobson has raised some broad questions of great importance for industrial organization in Great Britain. The system of production for private profit has depended for "efficiency and substantial justice" on free competition, and the classical arguments defend the system on this basis. Combinations of capital and labor, even before the War, were beginning to displace free competition in the fundamental industries—coal, railroads, public utilities, and even banking and insurance. The system is continually breaking down and trade is frequently interrupted by reason of internal struggles between these groupings; and the public dissatisfaction with the interruptions has been articulated in various proposals for other systems which can be stopped less easily.

Mr. Hobson notes that the common denominator for most of these proposals involves two major changes: (1) public ownership or control of the fundamental industries; and (2) representative industrial government. The less basic industries would remain in the "profiteering" class, making what money they can in the presence of laws designed to protect the consumer. Objections have been raised to such an Industrial Order on the ground that it would be impracticable; it would be difficult to finance the socialized industries under the new conditions; the incentives to technical and inventive ability would be missing; discipline in the ranks would fail, and labor would be inefficient; the proverbial diseases of bureaucracy would set in; and the consumer would be inadequately protected. The book deals with these objections and discusses the answers that may be made to them.

The chief objection is that industry will lack initiative and enterprise in the New Industrial Order. The author summarizes his answers to these objections in the following terms (p. 99):

"1. The industries proposed for nationalization, being relatively stable and routine in character, have less use for these qualities than those industries which remain within the sphere of private competitive enterprise.

"2. A great deal of this initiative and enterprise has no rightful place in socialized industry, being directed either to the achievement of profitable victories over trade competitors, or to the establishment of a monopolistic power to tax consumers, or to the performance of successful coups in the financial sphere.

"3. Nationalized industries should, however, be able to attract as much of these creative and progressive qualities as they require from men who combine them with a keen public spirit and a high regard for such distinction as the public services can be made to afford."

The other aspects of the author's statement are equally important, but the limitations of space forbid including them here, and the interested reader is referred to the book for an extremely interesting two hours.

Mr. Hobson has made a conservative statement of his own case, qualifying it sufficiently at every turn to satisfy the most suspicious critic. There is one aspect of presentation to which he might have paid

attention, although it does not come squarely inside the limits which he laid down for himself. The stir and seething of economic politics in Great Britain are stronger than in America, yet an American reviewer may raise two questions: (1) whether the English body politic has generally defined the issues as closely as Mr. Hobson, so that it views the remedy in the same light as he; and (2) even if it has, whether the national emergency is grave enough to compel the average Englishman to contemplate easily so major an operation as the nationalization of his basic industries. It must be remembered that the ordinary man prescribes specifics rather than tonics whenever he possibly can; it is his nature to. It will be necessary to organize a strong opinion in order to get the program adopted even gradually, and the strongest means of forming opinion appear to be in the very hands of those whom one would expect to oppose the New Industrial Order because of the manner in which their interests will be affected. It would be interesting to know Mr. Hobson's thoughts on the methods that the advocates of the plan must use if they are to realize it.

## THE BURDEN OF UNEMPLOYMENT

*By Philip Klein. Russell Sage Foundation, New York, 1923. 260 pp.*

Reviewed by William E. Lange

In the increased business activity of these times, the recent depression, the resulting long period of unemployment, and the consequent suffering to the worker are soon forgotten. We must thank Mr. Klein for recalling to us this period. In this volume he presents a study of the unemployment relief measures adopted in fifteen American cities during 1921–22. It forms a valuable record of this type of social work. Records of such activities during past emergencies have been rare and a new emergency finds us adopting measures which have in the past proved themselves to be inadequate. The adoption of such measures in future emergencies can be avoided by the use of the information presented in this volume. For that reason the book should prove of interest to those persons interested in social work.

Chapters which very probably will interest the general reader are "Work" and "The Homeless Man."

The problem of making or creating work during periods of depression has, and is, receiving much attention. The author discusses the following four methods of increasing or making work:

1. Undertaking immediately additional public work of a desirable character.

2. Executing immediately, with either public or private funds, any enterprises which, though not pressing, are desirable and would probably be undertaken in any case at some future time. This might be termed work relief.

3. Expediting and concentrating temporary work, odd jobs, and seasonal work into the period of deepest depression.

4. Continuing regular profit-making enterprises at the risk of loss to the *entrepreneur*.

"The Homeless Man" is the product, in many cases, of our economic system and as such should be given our attention. The Mid-West and West demand the migratory worker to harvest the wheat, cut timber, etc. His ordinarily hard lot is an increasingly hard one in times of depression, and because he is homeless few communities feel it incumbent upon them to look after him. The relief measures adopted and those which should be adopted are discussed by the author. The proper treatment of these individuals during depressions is an important matter and should be so considered. It is to be hoped that a perusal of this chapter will so convince the reader.

The second part of the volume is of interest to statisticians as it deals with the "Use of Employment Statistics" and "Statistical Indices Available in a Community."

## YOUTH AND THE OPEN DOOR

*By George Ross Wells. E. P. Dutton and Company, New York. 1922. 175 pp.*

REVIEWED BY R. F. LOVETT

An entirely non-technical treatment of individual psychological subject matter has been presented in this volume by Professor Wells. His easy manner of presentation of modern psychological principles makes the book valuable not only to the youths seeking the open door but also laymen seeking psychological light. Indicative of the general subject matter are his chapter headings of Instinct, Habit, Remembering and Forgetting, Attention and Interest, How We Reason, The Effects of Emotion and Character and Temperament. These scholarly titled lectures make up the chief part of the book. Three other chapters on Habits of Study, The Causes of Failure, and The Choice of a Vocation, are rather illogically tossed into the otherwise well arranged and proportioned popular interpretation of psychological precepts.

It is regrettable that through rigid adherence to continuity of purpose or some other unseen cause, Professor Wells has published his penned lectures (as mentioned in the preface) in such an unfinished state. All too conversational, and badly so, is the first chapter on instinct. To illustrate the point, on page 20 he sets out to name the four main purposes of instinct. After naming two purposes he side tracks them, shunts over to name two instincts, and then summarizes by naming four instincts.

Many *views* presented as *facts* may be questioned, as on page 89, "Memory is really the center of personality." One should be cautious in the use of such dogma when addressing the popular audience.

Quite helpful should be the chapter, The Choice of a Vocation. Fears aroused in an earlier chapter by the support given memory systems were here allayed when the phrenological charlatans were assailed.

## JOB ANALYSIS AND THE CURRICULUM

*By Edward K. Strong, Jr., and Richard S. Uhrbrock. Williams & Wilkins Company, Baltimore, 1923. VI + 146 pp.*

REVIEWED BY J. A. RANDALL

A new book on a new subject in a new field is always an epoch-making publication. Such is this work by Strong and Uhrbrock.

The so-called "efficiency movement" with which Taylor's name is associated has emphasized efficiency in utilizing material in production. Taylor applied analysis to plants, machinery and materials while he looked at man from the machine side, stop-watch in hand. Previous to his death comparatively little had been done in applying the same kind of analytical thinking and statistical work to the human problems in industry, as viewed from the man's side of the machine. Job analysis and job specifications since his death have made enormous progress, particularly as they are applied to the problems of employment and the problems of rate setting. Job analysis as applied to training both in the factory and in the schools has lagged behind the application of job analysis to other human problems.

Professor Strong and Mr. Uhrbrock present "a successful method for an objective determination of the content of a technological and vocational curriculum." The work is illustrated by a job analysis and curriculum for printing executives. In the text and in the illustration are clearly applied those fundamental analytical

methods which are in fact the elements of a new art. A critic of the work may say that this art is applied falteringly. Particularly conspicuous is the readiness with which the authors confess failure in their efforts to apply their technique to the liberal content of the course and to those elements of habit formation which result in the mental and social habits necessary for leadership of men and for the maintainance of the social status of the individual. Others are making progress in applying analysis more broadly than the authors have applied it. With others attacking the problems which have disconcerted the authors it seems probable that this book will be a forerunner of much other published material in the field.

The contents of the book may be very briefly summarized. The authors define Job Analysis and its uses. They discuss methods of accumulation of the data for job specifications, particularly as applied to the printing establishment. Their technique for the construction of a curriculum for a job analysis is discussed in an eighteen page chapter, the following chapter has fifty pages devoted to the presentation of the resulting curriculum, and the six pages in conclusion contain a critique of the resulting method of training at Carnegie Institute of Technology.

The book is crude in its organization and bookmaking but it is the crudeness that goes with a pioneer publication. The serious proposal to base an educational program upon job analysis has so much obvious merit that a book on this subject is certain to attract the attention of both personnel workers and educational thinkers. To both classes of readers, Professor Strong and Mr. Uhrbrock have contributed an interesting and valuable volume.

## THE STABILIZATION OF BUSINESS

*Edited by Lionel D. Edie. The Macmillan Company, New York, 1923*

Reviewed by William E. Lange

Despite the fact that periodically, in the past, we have had cycles of business with periods of boom and inflation followed by periods of depression and deflation, the belief that such cycles are inevitable, that they cannot be eliminated, that they may not even be minimized, is no longer prevalent. More and more, the fact is being recognized that violent fluctuations of of business, either up or down, are not the result of immutable laws but of bad business judgment.

This bad business judgment is the result of emotional errors arising from a lack of true knowledge of the facts. Business cycles are the result of a combination of certain causes. These causes are not plainly evident but their presence is indicated by certain signs or danger signals. Inability upon the part of the average business man to recognize these signs has resulted in the violent fluctuations of business which we have experienced in the past.

Literature upon the subject of business cycles and business stability has been descriptive rather than analytical. The business man has been obliged to wade through reams of descriptive matter on past business cycles to get a few worth while ideas to use in an attempt to forestall fluctations in his own business in the future.

In contrast to past attempts this volume, although descriptive, is at the same time analytical in its discussion of business stability. Further it is suggestive and offers possible and probable remedies for existing situations contributing to business instability. It is a very worth while contribution to business stability, for each chapter is written by a recognized authority

on the subject treated in the particular chapter. The presentation is not technical but is simple, understandable, and interesting. The volume should be read by all persons interested in the stablizing of business.

An indication of the scope of the volume may be derived from the following list of chapters:

I. The Problem of Controlling Business Cycles. Wesley C. Mitchell.
II. Stabilizing the Dollar. Irving Fisher.
III. Transportation and the Business Cycle. Frank Haigh Dixon.
IV. Unemployment-Prevention and Insurance. John R. Commons.
V. The Coördination of Production and Marketing. Lionel D. Edie.
VI. International Problems in Business Stability. Edwin R. A. Seligman.
VII. Public Works as an Agency of Control. John B. Andrews.
VIII. The Psychological Factors in Stabilization. Walter Dill Scott.
IX. The Applied Technique of Stabilization. Henry S. Dennison.

Despite the fact that each chapter is the work of a different individual, each links up to the others in such a manner as to form a unified whole. Duplications in the various chapters have been few. On the whole Mr. Edie is to be congratulated upon his skillful editing in bringing together the thoughts of men prominent in their respective fields of business, labor, economics and psychology, and making them available to us.

# Abstracts

*Present Tendencies in Personnel Practice.* ROBERT F. LOVETT. Industrial Management, June, 1923, Vol. 65, No. 6, pp. 327–333.

From this study of the present status of personnel work in 74 prominent concerns having more than 892,000 employees we find that

1. Roughly there were as many personnel departments established in the years 1919 and 1920 as had been established prior to that time.

2. There is a marked tendency to centralize control and decentralize execution of personnel work.

3. The tendency to decentralize execution of the work is much more common among those departments established during 1919 and 1920 than in those previously organized.

4. Departments established in 1919 and 1920 were generally too highly centralized.

5. Personnel departments in single unit concerns are more often administrative than advisory in nature, while in multi-unit enterprises the majority are advisory.

6. Comparisons of conditions in enterprises of the same type reveal a similarity of practices.

Below is a classification of the concerns from whom the information for this study was obtained:

*Manufacturing and Industrial*

| | |
|---|---|
| Machinery | 10 |
| Iron and Steel | 7 |
| Hardware, Tools, etc | 7 |
| Groceries and Food Products | 6 |
| Oil Refining | 5 |
| Chemical | 4 |
| Mills, Silk, Cotton, etc | 4 |
| Printing and Publishing | 2 |
| Office Specialties | 2 |
| Miscellaneous | 8 |

*Commercial*

| | |
|---|---|
| Insurance | 7 |
| Communication | 4 |
| Transportation | 4 |
| Financial | 2 |
| Department Stores | 2 |

These concerns vary in size from 257 to 240,000 employees and are scattered from Main to California and from Ontario to Oklahoma.

The full significance of the results obtained from this study is not realized until they are considered in relation to the dates of the establishment of the departments with reference to 1919, which may be termed the critical year.

It is obvious from the following table that Management considers personnel work a major part of its work.

*To Whom Personnel Directors Report*

| *Reporting to:* | *No. reporting* |
|---|---|
| Board of Directors | 4 |
| President | 13 |
| Vice President | 13 |
| General Superintendent | 17 |
| Plant or Factory Manager | 13 |
| Miscellaneous Boards and Officers | 9 |

Having analyzed these personnel organizations of all descriptions it remains to enumerate some confirmations of the foregoing indications of trend. In this regard the opinions of some of America's foremost personnel administrators are conspicuous. E. K. Hall, Vice President of the American Telephone and Telegraph Company, in his convention address before the National Personnel Association at Pittsburgh in November, 1922, said:

"The responsibility for this personnel job, as it seems to me, rests fundamentally, primarily and in the first instance, squarely on the shoulders of the management, and

in this particular by management, I mean the executives—the executive and his assistants."

In regard to the status of the personnel director his opinion is that, "the personnel man's job is fundamentally an advisory position, advisory to the executives."

Again W. W. Kincaid, President of the Spirella Company, also President of the National Personnel Association before the same convention said: "The office and the responsibility of the personnel director is to help management develop and conserve the most important element which enters into industry."

And, later, evidently going on the belief that a personnel director should be a staff officer, he said: "There must always be complete harmony of effort and coöperation between the line organization and the personnel director."

*Experiment and Statistics in the Selection of Employees: Methods Used in the Selection of Machine Operators in a Clothing Plant.* HARRY A. WEMBRIDGE. Quarterly Publication of the American Statistical Association, March, 1923, pp. 600–606.

A statistically reliable criterion of success of factory operatives is available in the plant of the Joseph and Feiss Company where the method of payment is that of piece rates with bonuses for certain standards of quantity and of quality. Using this criterion it was found that experience in the industry previous to application for employment was no guarantee of production and was practically negligible as a factor in selection. Dexterity and muscular coördination as measured by the three-hole tapping test gave zero correlation with the criterion of success. Personal estimates of applicants, made in the employment office with the aid of rating scales, likewise gave zero correlation. But a mental examination modeled upon Army Alpha and Beta gave a positive correlation, r = 0.51, p.e. = 0.029. A scatter diagram of 290 cases shows that if a certain minimum critical score in this mental test had been adopted, 48 operators with production below the average of the shop would have been eliminated to every 7 with production above the average, and only one really good machine operator would have been lost.

The writer concludes "that the use of mental tests, although only a partial measurement, is the quickest, most accurate and economical method of prophesying future skill at machines and of placing operators at types of work most suited to their capacity; and that a factory where payment is based upon standards which have been carefully established by time studies is peculiarly fitted to measure the value of industrial tests, since industrial success can be determined accurately by standardized productivity, and can be free from personal bias or varying definitions of what success may be."

*The Professional Masses—A Note on Ethical Standards in Business Practice.* The Cocoa Works Staff Journal, April, 1923, Vol. II, No. 3, pp. 106–109.

Discusses the formation of professional associations and the tendency of business to become a profession. The difference between the professional man and the business man lies in the intrinsic, as distinguished from the economic, interest alike in the process and the product of the work of the professional man. In a profession the earning of a livelihood is not the prime purpose. The prime purpose is the perfection of a service. Although professional associations are in their first stage designed to protect the immediate interests of their members they gradually develop into a stage where public needs are placed paramount to professional rights or desires. Business is becoming a profession and the tendency to form associations is a tremendous factor in its professionalizing.

*Practical Problems of the Placement Office.* DOROTHEA DE SCHWEINITZ. The National Vocational Guidance Association Bulletin, March, 1923, Vol. I, No. 8, pp. 124–128.

Reports the functions of the placement or employment office as the offering of

advice and information about occupations, assistance in finding a suitable position and, above all, employment supervision.

It is advised that the location of the junior placement office, whether it be organized under a state employment system or under the public schools, is at the greatest advantage when closely connected with the work-certificate issuing office. Here is an opportunity for advice and careful placement before too many mistakes are made. Close connection with the adult employment offices of the city is desirable so that much of this first-hand information concerning employment opportunities and conditions can be used for the benefit of the younger people. Adult bureaus should be encouraged to refer all applicants at least under eighteen to the junior bureau.

Teachers and vocational counselors should be able to turn to one central organization for assistance in obtaining information about occupations and current employment conditions.

Each placement is a problem, for it should be followed up to determine whether or not the worker is suited to the work. Work along this line by the psychological clinic of the University of Pennsylvania is reported.

*The Private Employment Agency.* J. B. M. Clark, Jr. American Federationist, April, 1923, Vol. 30, No. 4, pp. 303–305.

Describes the huge growth of private employment agencies in California; there were 203 such agencies in California alone last year, and between them they collected one and a half million dollars from the wage-earners of California, or an average of $7400 per agency. One agency in San Francisco makes a monthly net profit of $9500, largely collected from wage-earning men and women.

In Los Angeles, in order no doubt, to wear an air of respectability, some of these agencies have become affiliated with the Los Angeles Chamber of Commerce. The question of fees, however seemed to be one between agencies and their clients, and not a matter coming within the jurisdiction of the Chamber.

It is charged against the agencies that they work in collusion with unscrupulous employers with whom they share the fees taken from a number of employees who are sent in rapid succession to the same place, each one being kept only a short time and then dismissed and another one called for. From firsthand investigation it appears probable that all these charges are well founded, although it is a little difficult to see what kind of system could be in vogue in the office that hired and fired clerical help in the manner indicated, and was still able to keep its records in shape.

Men are shipped by the hundred by the private agencies out into labor camps in the country surrounding Los Angeles, and then through collusion between the agent and some gang boss or head foreman, are paid off in small batches at convenient intervals and replaced by others from whom further fees are collected.

According to the Deputy Labor Commissioner under the law at present constituted it is very difficult to bring the agencies to book, and as many of the laborers are migratory and do not stay long in one place, it becomes almost impossible to bring such cases into court and have them dealt with within a reasonable time. The laws apparently are in need of some tightening up, and it is felt that more power should be vested in the Labor Commissioner to conduct cases of this kind himself and impose certain prescribed penalties upon those persons guilty of violating the law.

What appears to be the most active ameliorative factor in the situation is the Public Employment Bureau of the State of California, which conducts industrial, commercial, and household departments, without fees of any kind either to the employer or the employed, and which seems to be operated with vigor and efficiency. The only unfortunate feature seems to be that for political reasons the Public Bureau does not advertise in the newspapers, and newcomers frequently do not know of its existence until they have had more or less expensive experience with private agencies.

*A Practical Operating Organization.* DWIGHT T. FRANUM. Administration, April, 1923, pp. 426-438.

Discusses the organization requisites of successful business management, showing that each organization plan must take into account the laws of human nature and the requisites of each managerial function.

Management, divided into financial, sales, and production management, has two functions; the administrative function and the executive function. These, in turn, are divided into two types of activities, "line" and "staff." The former is concerned with *when* duties are to be performed; the latter is concerned with *how* work is to be done.

In working out a practical organization, i.e., fitting the existing or obtainable personnel to the physical layout best fitted for the conduct of the business, nine steps must be taken: (1) Analysis of physical layout; (2) Determination of reasonable standards which may be attained by departments; (3) Combination of duties of a like nature; (4) Visualization of the standard organization by charts and descriptions; (5) Analysis of existing personnel; (6) Determination of immediate steps toward standards; (7) Education of the personnel to their new duties; (8) Agreement upon and plan for reaching the standard organization within a reasonable time; (9) Consistent and systematic efforts to develop the personnel towards the standard.

*The Use of Routine Charts.* G. CHARTER HARRISON. Management Engineering. April, 1923, Vol. 4, pp. 223-225.

Simplifying the routine in factory offices can be accomplished by arranging the forms used for each line of work on charts to study improvements in procedure. The time of the average minor executive is generally too much taken up with the immediate business in hand to give much thought to the devising of ways and means for improving the routine of his department. If he should prove to be ambitious, his field of action is limited, for however closely his work is related to that of other departments, any attempt on his part to investigate the methods of these departments is apt to be regarded as an intrusion and so resented. The expert called in from the outside is not handicapped by these things. Also the outside adviser has a field of experience to draw upon. To obtain a complete understanding of the clerical routine of a large business is naturally a proposition of considerable magnitude. The expert can make a report that is brief and to the point which can be easily understood by the busy executive. No difficulty will ever be experienced in getting support in introducing a really desirable improvement, and the routine chart gives the comptroller a simple and effective means of demonstrating that his proposed changes are worthwhile.

*Organizing the Liberal Arts College for Vocational Guidance.* EDGAR J. WILEY. The National Vocational Guidance Association Bulletin. April, 1923, Vol. 1, No. 9, pp. 143-147.

The vocational guidance program at Middlebury College reaches down into the preparatory school for information about the personal qualities, activities, interests and purpose in coming to college of the candidates for admission, begins to function definitely in the Freshman year, continues throughout the course, and follows the graduate as he takes up his work or professional study after leaving college. The program includes:

1. The collection of information about prospective students.
2. Required study of occupations in Freshman year.
3. Lectures for Freshmen given by department heads.
4. A bulletin, "Programs for College Students."
5. Lectures by men of prominence in various important occupations.
6. A special vocational guidance section in the library.
7. An undergraduate committee for assisting in the choice of vocational speakers and subjects.

8. Assistance of the college paper.
9. A personal rating system.
10. Contacts with business and industry.
11. Counseling.
12. An appointment bureau.
13. Following up and securing the cooperation of the graduates of the college.
14. The keeping of records.

*The Vocational Changes of One Thousand Eminent Americans.* H. D. KITSON AND L. CULBERTSON. National Vocational Guidance Association Bulletin, March, 1923, Vol. I, No. 8, pp. 128–130.

Reports that of the 1000 eminent persons investigated, who were chosen according to the arrangement of the alphabet from "Who's Who in America" (1919-1920), and who may therefore be regarded as a fair sampling of the 25,000 eminent persons in America, 164 or 16 per cent recorded changes in vocation. These persons have not been obliged to make very many changes before reaching their present vocations, 63 per cent being recorded as having changed only once, and the entire 164 as having changed but 269 times, on an average of less than twice. It is of course possible that some failed to report certain changes.

One-third of the changes were made before the age of 25, and two-thirds before the age of 35, showing that most of these successful people had settled upon a satisfactory vocation before the approach of middle age. However, there remains one-third who changed after 35 showing that changes in middle life are quite usual.

Ninety per cent of the cases examined had received training of collegiate grade. The vocation of politician containing 77 per cent of those who changed, contains the largest number of persons without higher education—26 per cent; that of writer containing the second largest number who changed, shows the second largest proportion of uneducated. Those occupations showing fewest changes show the smallest proportion of persons without advanced training. From which the conclusion may be drawn: The higher the degree of education, the less the chance of change.

*Intelligence and Interest in Vocational Adjustment.* DOUGLAS FRYER. The Pedagogical Seminary, June, 1923, Vol. 30, No. 2, pp. 127–151.

Describes an investigation, first, of the relation of intelligence, as measured by intelligence tests, to vocational adjustment, and second, of the value of vocational interest as a criterion of adjustment. The studies are based on data secured from the cases of 320 men, ranging in age from 16 to 44, who voluntarily applied for vocational counsel to the Vocational Department, Central Branch, Y. M. C. A., Brooklyn, N. Y.

Each of the 320 subjects was interviewed about five times, examinations including physical, psychological, vocational, educational, religious, specifically occupational, and personal history.

The *actual* and *desired* occupations of the subjects, secured from personal history blanks, were given intelligence ratings corresponding to the median found to exist among workers in those occupations.

The subjects were tested for general intelligence in groups through the use of Army Alpha, form seven, or Business Alpha, and individually for re-examination through the use of the Binet or Army performance. All scores were expressed in terms of Army Alpha. The Army classification for intelligence was used.

The conclusions reached in these studies may well be quoted from the summary. They are as follows:

"1. On the basis of the sources from which subjects for vocational counsel come, it appears that men seeking employment are not usually interested in vocational counsel, even though this service be offered without charge, while men already in positions form the largest group desirous of counsel. Men in the higher occupational levels are those most interested in going through a prescribed process of vocational counsel in the hope of advancing themselves.

"2. Men higher on the scale of intelligence, or above the average, are most interested in vocational counsel. Of the 320 men studied 88 per cent fell in the intelligence groups of very superior, supe-

rior and high average; 72 per cent in the two superior groups while the very superior or 'A,' showed the highest percentage of any single group, 45 per cent. This is in striking contrast to a distribution of intelligence of the Army or of the adult population.

"3. Men applying for counsel below the age of thirty are higher on the scale of intelligence than are men above thirty.

"4. Allowing a probable error of 25 points either side the median it has been found among the subjects applying for vocational counsel that 60 per cent are maladjusted on the basis of intelligence, 50 per cent because of more and 10 per cent because of less intelligence than required by the occupation in which they are engaged. In the correlation for the entire group $r = + 0.47 \pm .029$, and for the various age groups there is no significant difference. On the basis of this study there appears no close correlation between intelligence of men applying for vocational counsel and intelligence-requirement of the *actual* occupation.

"5. Older men applying for counsel, thirty years and over, appear to be suffering vocational maladjustment because of less intelligence than is required by their occupation to a greater degree than is true of men under thirty. Younger men, on the other hand, appear to be suffering maladjustment because of more intelligence than is required. Standard deviation of the group over thirty is sufficient for the figures to be accepted as suggestive, although the number of subjects is small.

"6. Considering the intelligence-requirement of the desired occupation of the counsel subjects there appears no high correlation between vocational interest and ability as measured by the intelligence test. $R = + 0.38 \pm .058$. If these counsel subjects could be placed in their desired occupation a high degree of maladjustment would be present on the basis of intelligence; allowing a probable error of 25 points each side the median 36 per cent would be maladjusted because of more intelligence and 15 per cent because of less intelligence, so that a total of 51 per cent would be maladjusted if placed in the occupation of their desire.

"Among adolescents, according to a study of 806 high school students, a still higher degree of vocational maladjustment would occur if the subject were placed in their occupational ambition. $R = + 0.21 \pm .02$, for the intelligence requirement of the vocational interest and the ability as measured by the mental test.

"Based upon these and other investigations where objective methods of measuring ability are used it seems that a correlation of *not more* than 0.5, and probably less, is present between interest and ability in adults and that among adolescents the correlation is still lower.

"7. No great difference appears between the *actual* and *desired* occupations from the standpoint of predictive significance in vocational adjustment. There are decided unlikenesses between these occupations. The desired occupations are on the whole higher on the scale of intelligence. While there are more vocationally maladjusted on account of superior intelligence in the actual occupation, if the subjects were placed in the desired occupation there would be more maladjustment because of less intelligence than required for the occupation. The correlation coefficient between the actual occupation's requirement and intelligence of the subject indicates a more exact relationship existing there than would exist between the desired occupation's requirement and intelligence of subject. But, considering the proportions of the subjects, a higher percentage (49 per cent in desired occupation, 40 per cent in actual occupation) falls in the group having approximately the same intelligence as required by the desired occupation.

"8. From this study of 320 vocational counsel subjects there appears to be in intelligence a factor of vocational maladjustment of considerable importance. These men, expressing their vocational dissatisfaction by applying voluntarily for counsel, display a decided disharmony between their rankings in general intelligence and the requirements of their occupations in general intelligence. Considered as a separate factor, distinct from all others, intelligence appears to block

out an individual's vocational possibilities, and the placing of an individual in an occupation requiring to any great degree more or less intelligence than is present in the individual may be expected to result in vocational maladjustment.

"9. The findings of this investigation do not deny the psychological significance of interest as a drive to activity, nor do they deny the limitation placed upon interest, as well as ability, by hereditary endowment.

"10. While this investigation indicates the quantitative importance of intelligence wastage as a factor in vocational maladjustments its data do not bear upon the relative significance of intelligence among other factors of adjustment, e.g., the affective factors, economic factors, social factors, etc."

*Measuring Interest Objectively.* HAROLD E. BURTT. School and Society, April 21, 1923, Vol. XVII, No. 434, pp. 444–448.

Preliminary experiments were made with mental tests designed to measure interest and industry rather than ability. Four principles were studied. (1) The subject crossed out irrelevant words scattered through two prose selections. One selection was normal and the other a vigorous talk about zeal, industry, achievement—a typical "pep-talk." The theory was that the subject who was industrious and enthusiastic about his work would involuntarily devote a higher degree of attention to the content of the "pep-talk" and would overlook more irrelevant words than he would in the normal selection. (2) Test of auditory memory was given by the method of word pairs with logical material comprising pairs of three types: normal, related to agricultural engineering (the vocation of those tested) and dealing with industry, achievement, etc. The supposition was that the student interested in agricultural engineering would more readily associate pairs of words related to that vocation and his memory for such words relative to that for normal words would be a measure of his interest. (3) In the above memory test it was thought that word pairs dealing with industry and enthusiasm for work, etc., would appeal especially to persons possessing those traits and they would score more highly on such words relative to normal words. (4) An information test in conventional form was used dealing with facts in agricultural engineering.

The tests were compared with instructors' estimates as to "interest and industry" and also estimates of ability in agricultural engineering. The first test seemed somewhat promising, correlating more highly with interest than with ability. This was further substantiated by the partial correlation coefficients. Test II had an appreciable correlation with interest but a higher one with ability and appeared more differential of the latter. Test III proved of little value and Test IV correlated considerably more with ability than with interest. The results presented are not to be considered as final but rather as suggestive of the possibilities in measuring inaccessible mental factors.

*The Intelligence Testing Program and Its Objectors—Conscientious and Otherwise.* GUY M. WHIPPLE. School and Society, May 26, 1923, Vol. XVII, No. 439, pp. 561–568 and No. 440, pp. 596–604.

Combats the attacks of those who believe, or say they believe, that intelligence tests are unjust, unsound, and have fallen into disrepute.

Lippmann stated in the "New Republic" that "the intelligence tester starts with no clear idea of what intelligence means," and Bagley in "School and Society" stated that the determinist "argues back to a hypothetical factor which, far from having isolated, he has never clearly defined." Perhaps the use of the term "mental alertness" in place of the term "intelligence" would have avoided argument on this point; even so, the fact that psychologists have different conceptions of the term "intelligence" need not stifle experimentation any more than the varied conceptions of "electricity" stifle research in the physical sciences.

Many objections to tests are based on the problems of reliability and validity.

We are told that the results of tests are useless because some of the subjects "outdo themselves," while others "cannot do themselves justice." It is claimed by Ruml that "we know pretty well that our general mental adaptability to new problems varies markedly from time to time and place to place." It seems though that some of these same critics are fairly well pleased with the coefficients resulting from the correlation of scores on two applications of the same test on the same subjects.

In answer to Lippmann's statement that "not enough observations have yet been made to know whether the results are typical or not," we need only to cite the millions of cases on record and to then refer the author of the statement to accepted statistical method.

Some of the men who have been recognized as leaders in the testing field may be quoted:

President W. D. Scott says, "The time is past for discussing the effectiveness of mental alertness tests. They are effective. They will be used increasingly. The agreement between the grades used in mental alertness tests and the grades received during the later semesters in college is more complete than the agreement with any other procurable single factor."

Dean Haggerty says that mental tests covering three hours have a higher prognostic value of future success in work in a medical school than have previous academic records.

L. L. Thurstone says that "mental tests which occupy one hour predict freshman scholarship more accurately than the second semester's scholarship can be predicted from that of the first semester."

E. L. Thorndike, in discussing the measurement of general capacity to handle facts and symbols, says: "This measurement has abundantly proved its worth. It gives a very close prophecy of the grades a pupil will obtain in his freshman year. . . . . It points out almost unerringly any very stupid boys who have been hauled into college by their teacher's skill and their parents' money; or who have floated into college by careless certification."

We could quote Professor Colvin, whose caution is approved decidedly by Bagley and Lippmann, as saying: "There is no reasonable doubt that the present intelligence tests do indicate to a fair degree native ability to learn," also, in another place as saying that if Bagley means "that in general it is not possible to determine within reasonable limits what the native capacity of the child is, provided adequate intelligence tests are employed and common-sense precautions taken," then he is wrong.

In contrast to such outstanding championship of tests as is cited in some of the quotations just given is the attitude of extreme caution on the part of some of those who have done excellent work in mental testing. This attitude was markedly noticeable in the speeches given at the Chicago meeting of National Society for the Study of Education, which was devoted to a discussion of intelligence tests.

Lippmann, in answer to a quotation from Lothrop Stoddard's "The Revolt Against Civilization" states that it is quite impossible for the average mental age of Americans to be only about fourteen years. He is referred to the results of Army tests and to the findings of E. A. Lincoln, W. F. Dearborn, and G. M. Whipple.

Besides the critics of the tests there are those who object to the testing program. "It is declared that a wrong use is being made of test results or it is declared that no use at all should be made of them; that the test results are wrongly interpreted; that classification in the schools is undemocratic; that it is a crime to stigmatize a child as subnormal (Bruce and Comings); that the assumption that we can measure differences in native endowment and that these are relatively stable differences 'threatens to overturn the entire theory and practice of democratic education, and so on.'"

Just as the physician errs at times in diagnosis, prescription, and prognosis, so does the applied psychologist. But these cases of error are hard to find. Men-

tal testing makes possible a classification which is followed by an increased interest in the issues raised by problems of education. A summary of the points especially noted in an article by Helen Davis, "The Use of Intelligence Tests in the Classification of Pupils in the Public Schools of Jackson, Michigan," as printed in the Twenty-first Yearbook of the National Society for the Study of Education, gives the following: "The pupils are happier; the pupils are more successful; the teachers coöperate; better methods of instruction are appearing; the parents are appreciative; does this sound like inflicting criminal injury upon children or disgracing families or threatening the foundations of democracy? It is to laugh!"

To quote only one answer to the statement that mental testing is "threatening the foundations of democracy," Herbert Hoover's attitude may be recognized in the following words, "We in America have too much experience of life to fool ourselves into pretending that all men are equal in ability, in character, in intelligence, in ambition; that was a part of the claptrap of the French Revolution."

*The Mental Tests of a Superior Child.* H. Dealey Dvorak. Mental Hygiene, April, 1923, Vol. VII, No. 2, pp. 250-257.

The usual dissatisfaction experienced by school authorities when their professional judgment comes into conflict with psychological tests may be illustrated by the story of an eight year old boy who was in the third grade, Section A, of one of the Twin City schools in the year 1921.

In the third grade Tom disliked school, made low grades, and developed the habit of "feeling sick" in the morning, with recovery about noon. He was interested in athletics and showed to advantage a fine physical build; furthermore, he read such books as Tom Sawyer, Huckleberry Finn, the Book of Knowledge, Popular Science Monthly, and the Boy Scout Magazine.

Tom's mother, who had been a teacher in the elementary grades before her marriage to a professional man, suggested that her son be given extra promotion. She was advised that nothing could be done until he had taken a mental test. Accordingly, he took Haggerty Delta 1, a group intelligence test for grades one to three, and scored 64 points, 6 points below the norm set for third grade pupils. Tom's mother was dumbfounded at the results, and asked for a check. The psychological examiner was too busy to check the results and referred her to the University of Minnesota psycho-educational clinic.

Here Tom took the Stanford-Binet, brief scale, and showed a mental age of 15 years 9 months, in contrast to his chronological age of 8 years 7 months, and showed an I.Q. of 183, which was one of the three highest quotients obtained at the clinic during a period of four years. Little wonder that Tom found no interest in third-grade subjects.

The school psychologist, on learning these facts, explained them away by saying that Tom must have been coached by his mother. However, she explained to the examiner at the clinic that she had not only never worked with the Stanford-Binet, but also realized that if Tom had been coached, it would be evident after advancement to a higher grade in school.

At the second visit to the clinic Tom was given Haggerty Delta 2 which is a group intelligence examination for grades three to nine, and is consequently much more difficult than Delta 1 for grades one to three, in which Tom scored slightly below the norm. However, on the Delta 2 examination, he scored 91 points, or 4 points above the age norm for the representative thirteen year old child. An explanation of the causes of the discrepancy between the two test results may lie in the fact that in Delta 1, two of the tests are built on opposites which are of such a nature that too fine a distinction must not be made. Tom's discrimination in these cases was too keen.

For a further check he was given the Army Performance Test, brief scale, standardized for adults. On this Tom's score was 179.3, which is equivalent to a mental age of 12 years and 6 months.

The clinic examiner used two tactfully worded pages of writing in communicating

the results of the three tests to the principal of the elementary school, and suggested that Tom be permitted to try the fifth grade. No answer to this letter was received. On visiting the principal a week later Tom's mother was told by him that they were "not taking orders from the University of Minnesota." None of the authorities would yield an inch.

"Frankly speaking, is this a unique situation? Should we not hear more about the *failure of school officials* to cooperate with children and parents? We hear enough about parents who do not 'coöperate' with school authorities or who are irrational in their criticism of the school. And how about the resultant effect upon the 'morale' and 'mental health' of the child and his parents?"

Tom's mother succeeded in placing her son in another school, where individual mental tests were given and their results sanely interpreted and acted upon. At this school Tom was given the Kuhlmann intelligence examination by a university examiner and in this obtained a mental age of 11 years 7½ months, with an I.Q. of 133.

The mother went again to a high authority and offered this fourth bit of evidence that her son should be given extra promotion. After some deliberation on the part of the authority Tom was permitted to enter Grade 5B.

He has since been almost at the head of his class and has developed a better attitude towards and interest in school work. This case of mistreatment of a superior child is not unusual and calls for the following summary statements: "First, a group intelligence test for primary children may prove *too easy* for young children of very superior intelligence. Second, the exceptionally superior child is so rare that when found in a school, he is often not recognized. Third, *a priori* judgments tend to persist despite conflicting objective evidence."

*The Psychology of Motivation.* F. A. C. Perrin. Psychological Review, May, 1923, Vol. 30, No. 3, pp. 176–191.

Reviews some of the representative accounts of motivation found in psychological literature and emphasizes certain aspects of motivation which seem especially appropriate in a psychology of personality and character.

In connection with the second purpose, one central thesis is maintained; namely, that while the important human motives are distinctly biological in character, they also reflect a universal human desire for prestige.

The term, motive, admits of at least two definitions. In the first place, it refers to an "inner" psychological process or function, a driving force to be found chiefly within the organism itself. In the second place the term suggests a plan, purpose or ideal with the definite implication of an ideational element.

The difference between human motives and animal incentives to behavior is merely the difference between biological incentives in a socialized and intellectualized setting, and biological incentives which need only sensory stimuli for their arousal.

Popular and non-scientific opinion in regard to motivation is expressed in terms of morals. Ideals are the forces of righteousness and they are opposed to appetites or the demands of the flesh. In instances of abnormal motivation two sorts of explanation are frequently offered; the offender is either a "beast" or a person possessed of an evil spirit.

Possibly the first attempt actually to explain human motivation in terms of a definite psychological law found expression in the theory of hedonism. Although the theory of hedonism is logically unsound, it finds a certain amount of support in the data bearing upon human motives. An analysis of concrete human desires discloses the fact that many individuals rather definitely know their own desires. They desire health, wealth, love, social and professional advancement, physical and aesthetic pleasures, because they know that these things are calculated to bring pleasure and happiness.

Modern psychology rests upon a biological basis and while writers of current texts and exposition are in general agreement regarding the human organism, they differ somewhat in their conception of its integrative functions. Some writers

state or imply that a list of reflexes, instincts, emotions and habits constitutes an inventory of human motives.

Paton identifies motivation with will or voluntary and intelligent control, but he explains will in terms of simpler psychoneural processes. Warren defines motives as a conscious or subconscious condition which plays a part in delivering one's behavior or conduct. Smith and Guthrie treat motives as a classificatory heading under which the delayed reaction, preparatory and consummatory responses, drive, over correction and similar rubrics are placed. Woodworth recognizes the biological aspects of motives, emphasized in the present paper by stating that motives range from primitive or primal, like hunger to the very advanced, such as zeal for a cause.

Whether or not the behavioristic standpoint is valuable or essential for a psychology of motivation depends upon the corrollaries of that doctrine. Behaviorism would not suffer and would indeed profit through an increased emphasis upon the mental mechanisms aroused by various stimuli and responsible for the various responses.

Freudian psychology swings away from the concept of stimulus and reduces all motives to a single driving force.

Social psychology has offered its own theories of human motivation. Colley's fundamental principle is that of social consciousness.

The author takes a biological-social view of motivation. The beginning step, therefore, in the analysis of human motives is to classify such desires and to ascertain under what conditions they appear. But it is most important to note that all human biological desires are intellectualized and socialized.

Three sorts of human biological activities may be described; namely, those concerned with eating and hunger satisfaction; with the satisfaction of sex desires, and with the demand for physical comfort. These three groups of desires include the chief positive biological cravings. To be well fed, to enjoy the experience of physical love, to be physically comfortable—the healthy sensuous individual could ask nothing more from life.

But even stronger is the prestige motive. When we observe individuals in their concrete social relationships, we find that they demand (a) to be noticed, (b) to be favored as objects of care and attention, (c) to be complimented and acclaimed, (d) to be loved, (e) to exercise power and authority.

The prestige motive represents the socialized aspect of biological struggle. Its different forms can be traced directly to biological needs.

*The Personnel Content of Office Management.* FRED W. TASNEY. American Management Review, July, 1923, Vol. 12, No. 4, pp. 3–4.

In order to establish a program for consideration, the Office Executives Division of the American Management Association sent to Committee members a questionnaire covering forty subjects relevant to office management with a request that ten of the forty be checked and returned in the order of their importance.

The responses from the members of the Committee were of such interest that they suggested a larger experiment. Accordingly, the questionnaires were sent to a number of Association members with a view to gaining a more reliable distribution.

An analysis of the replies shows the following results:

The largest number of those replying considered as their most important problem, (in order of importance) Transfer and Promotion Methods, Basis of Remuneration, Developing Supervisory Staff, Salary Standardization, Job Analysis, Employment Methods and Absenteeism, Tardiness and Office Manuals, Educational Classes.

"A further analysis of the replies disclosed the fact that while 'Developing Supervisory Staff' is considered of third importance, in so far as total number are affected it is really of first importance in the number giving it first place, and, on the same basis, 'Basis of Remuneration' holds second place."

It is rather striking that not one of the replies included "Coöperative Buying."

Some of the other subjects considered of lesser importance are Recreation, Vacation, Cafeterias, Health Supervision, Mutual Benefit Associations, Service Annuities, and Service Disability Payments.

It is worthy of note, especially when we recall that the aim of the Association is to consider as largely as possible, the human factor in industry, that the results shown by this experiment are not consistent with those expected after observation of the apparent interest shown in certain subjects which have from time to time appeared in publications of the Association and in discussions in both committees and on the floor of the Convention.

*Five Years of Vocational Education in the United States.* International Labor Review, April, 1923, Vol. 7, No. 4, pp. 636–641.

Summarizes the Sixth Annual Report (1922) of the United States Federal Board for Vocational Education which gives a general survey of the work done during the first five years of the operation of the Vocational Education Act of 1917.

The Federal Board is now organized in five coördinate services; the Agricultural, Trade and Industrial, Home Economics and Commercial Education Services, which administer the Vocational Education Act of 1917, and the Vocational Rehabilitation Service established under the Industrial Rehabilitation Act of 1920. The work of the last named service, much of which is not strictly vocational education, is not included in this summary.

The primary duty of the Federal Board is to administer the Federal funds set aside for vocational education and granted to the States on condition that they accept the Act, appoint a vocational education board, and supply at least one dollar for every dollar provided by the Federal Government. The Board in Washington approves the State plans, supervises expenditure of Federal funds, conducts investigations, organizes conferences and in general acts as an advisory body. The increase in the total expenditure on vocational education is here shown:

| | |
|---|---|
| 1917–1918 | $3,019,750 |
| 1921–1922 | $14,770,143 |

Since the passage of the Act of 1917, the type of education offered has changed considerably. In agriculture there has been a great development of education of pre-college grade and the instruction has become much more practical. This is also true of Commercial education. An attempt has been made to analyze the job of home making, and the Board recommends more extensive provision for Home Economics education as the funds for this purpose have been inadequate.

The total number of schools has increased from 1741 in 1917–18 to 4945 in 1921–22 and the number of teachers employed has increased from 5257 to 12,280. Statistics are given to show the types of school included in the total, the number of pupils, the average enrollment per school and the per cent of women pupils.

For the future, the most urgent need is a great increase in the number of part-time schools to meet the needs of approximately three million children between the ages of fourteen and seventeen who are not in school. The Board insists on the necessity for extension of agricultural education for greater attention to the vocational training of women and girls, for special provision for commercial education which hitherto has been financed with Trade and Industrial education, and for the development of a greater supply of trained teachers.

*Education and Training as a Management Process.* W. W. Kincaid. American Management Review, May, 1923, Vol. XII, No. 2.

Reports the importance in the management process of education and training and points out that when those who are performing the management function have completely arranged for their own continuous development, a program for the education and training of the rank and file in the organization comes with much better grace.

One of the most important elements in an education program today is the molding

of a united working force. This is an even greater responsibility than the job of training individual workers for individual jobs, and it is a responsibility that rests finally on the executive officers of the organization. Every worker must be shown how to make his efforts fit into and support the work of other individuals and of the whole organization. A prominent executive is reported to have said that an analysis of the management function in the company, of which he is president, showed that out of the specific duties into which the management function can be divided, nine out of ten could be classified under education and training.

*Child Labor and Apprenticeship.* Pennsylvania Department of Labor and Industry, The American Child, April, 1923, Vol. 5, No. 4, p. 2.

Reports that the complaint is often heard that child labor legislation reacts against apprenticeship because in some cases it prevents the employment of apprentices under 18 years of age. There are cases where the limitations have retarded the development of apprenticeship in trades where it is thought a 16 year old boy might be safely employed. The young man who has reached the age of 18 is usually unwilling to accept the remuneration given during the initial stages of learning a trade and will knock about trying various juvenile employments and thereby loses the desire or willingness to study, which, of course, is essential in the acquirement of any trade.

In child labor legislation, two things must be kept in mind; the schooling of the child and the life work of the child. The public school ought to have complete jurisdiction over the child of fourteen years of age and under. Special child labor legislation might begin at this point for minors between 14 and 16 years of age. There are occupations in which a child at this age might engage, but we should make sure that such occupations are not of the blind alley type. The real child labor legislation should include only minors between 16 and 21 years of age. It should not confine itself merely to making lists of prohibitive occupations, but should be constructive as well in the sense of promoting a modern system of apprenticeship.

*Manufacturers Are Divided on Five-Day Week.* Industrial Bureau of the Merchants' Association. Greater New York, June 25, 1923, pp. 5–7.

Describes the results of replies to questionnaires sent out by the Merchants' Association to forty members located in Eastern States, where the plan seems to have been more generally introduced than in other parts of the country. "The industries represented are as follows: Shoes, Textiles, Clothing, Tools and Machines, Paper Products, Metal Products, Food Products, Rubber Goods, Pencils, Jewelry, Insulated Wire, and Bleacheries."

The five-day week plan was adopted by these companies in 1916, or since that time. Of the forty manufacturers replying to the questionnaire three reported that they had used the plan only in the summer, and three reported its use in slack periods. At the time the survey was made, twenty-seven of the thirty-four who had adopted it as a permanent plan were still using it, fifteen "because they had found it very satisfactory, ten because they were forced to do so by the union to which their employees belonged, and two partly because the unions have insisted upon it and partly because they have no serious objections to it themselves." Sixteen of the thirty-four expressed themselves as well pleased with the five-day week, fifteen were strongly opposed to it, one took a neutral attitude, and two favored it only when operating on a weekly schedule of forty-eight hours or less.

The reasons for adopting the plan and the results of its operation in the several kinds of businesses represented are as follows:

*Shoes.* Of the fifteen shoe manufacturers who replied to the questionnaire thirteen stated that they were forced to adopt the plan by local unions, and two stated that they adopted it at the request of their employees. Eleven of the thirteen forced

to adopt it are now strongly opposed to it, while one favors it, and one is neutral. Of the two who adopted it by request one is opposed to and one is in favor of it. The two shoe manufacturers who favor the plan enumerate the following advantages:

"1. It does away with the unsatisfactory Saturday mornings when the workers are always restless.

2. Overtime night work can be almost completely eliminated by using Saturdays for most of the overtime work necessary.

3. The day sheet system is more easily handled when all the days are of uniform length.

4. Saturday mornings can be used to even up the work of any departments which have fallen behind during the week."

The disadvantages enumerated by the fifteen who have found the results very unsatisfactory include the following: Delayed shipments, reduced production (estimated to be 10 per cent), increased overhead costs per unit of production, unfair advantage held by competitors, disarranged mail, temptation for workers to slow down to obtain overtime on Saturday, dissatisfied customers on account of delays, increased cost of shoes due to increased cost of manufacture.

*Textiles.* All five of the textile manufacturers who replied to the questionnaire adopted the plan as an experiment when they reduced their weekly time schedule. Four of these five companies have abandoned the plan and are working again on the fifty-three or fifty-four hour week. Two of those who abandoned the plan believe it to be the best system for a forty-eight hour week, but they prefer the longer week. The fifth manufacturer is well pleased with the plan. The following advantages are noted by the three textile manufacturers who believe in the plan for a forty-eight hour week: Increased production, smaller labor turnover, reduced absenteeism, and elimination of the usual high Saturday starting and stopping loss. The two manufacturers who are completely opposed to the plan state the disadvantages as being a decrease in both production and efficiency.

*Paper.* Four paper manufacturers replied to the questionnaire. One adopted the plan because the employees were wasting time on Saturday, and another to save stopping and starting costs and to provide a daylight overtime period. The third used it only during the summer to save starting and stopping losses. The fourth did not state a reason for adopting the plan. The three first mentioned are operating only five days a week, two for 12 months per year, and the third for 6 months per year. These three cite the following advantages: Increased production, slight reduction in overhead per unit of production, decrease in absenteeism, decrease in labor turnover, opportunity on Saturday for replacements and repairs, elimination of Saturday starting and stopping losses. The paper manufacturer who has abandoned the plan states the chief disadvantage to be the delay in handling orders.

*Clothing.* One of the three clothing manufacturers stated that they adopted the five-day week for observance of the Jewish Sabbath. Another wanted to give their employees (who, for the most part, are women) Saturday for cleaning, shopping, etc. The third stated that they adopted the plan to save power, to reduce absenteeism, to secure an extra labor supply, and to leave Saturday for reaching the weekly quota. All three still use the plan.

The advantages given by these three companies are similar to those stated in earlier paragraphs. The advantages which have not been previously listed are:

1. More exact planning is possible because of the flexibility introduced by the extra half day.

2. A new source of labor supply is opened up among the women who could not take jobs if they could not have both Saturday and Sunday free.

3. The most desirable workers in the industry can be secured.

4. The children of the workers become better citizens because their mothers have more time to train them carefully.

5. Real religious equality is established. Jews, Seventh Day Adventists, etc., are free to observe their Sabbath as they see fit.

*Miscellaneous.* The advantages and disadvantages reported by this group are included in those already stated. A majority of these concerns found the plan quite satisfactory.

As a result of this survey the following conclusions have been reached:

"1. The five-day week is the best plan of operation in factories operating on a weekly schedule of forty-eight hours or less, particularly in those factories in which the starting and stopping processes are long or costly.

"2. It seems advisable to include in the plan a provision whereby, whenever a holiday occurs on any day other than Saturday or Sunday, same shall be made up on the following Saturday without extra pay.

"3. It would also seem advisable to include in the plan a provision whereby, whenever it is deemed desirable by the management, workers or departments responsible for any deficiencies in production, shall make up such deficiencies on Saturday morning, without extra pay."

*The Cleveland Garment Plan.* F. C. Butler. Industrial Management, May, 1923, Vol. LXV, No. 5, pp. 314–317.

In 1918 Cleveland faced a general strike of the entire garment industry. It was through the work of a board of three referees appointed by the Secretary of War that the plan was devised for an agreement in December 1919 providing that there be no more strikes and lockouts. Provision was made for a board of three referees entirely unconnected with the industry embodied with the sole power to fix wages. This board was headed by Federal Judge Julian W. Mack.

The most difficult factor in the situation was wage measurement. This was taken care of finally by the appointment of an industrial engineer to direct time studies on which to base production standards. In each shop there is a joint board of control composed of equal numbers of employers and workers, with the industrial engineer as chairman and the court of last resort in disputes, subject only to an appeal to the board of referees. The time-study man in each shop measures the production of workers and arrives at a standard for each elemental operation which theoretically represents the number of minutes the average worker in the shop would require to do the task at his normal speed. If the firm and the workers' committee fail to accept his standards, they are refigured. If the standards are still objectionable the industrial engineer is called in to pass on a final measure. The standards include certain arbitrary allowances for delays which are unavoidable as determined by practice in each shop.

"There are 2640 minutes in each workweek and the proof of standards is that the average worker can make 2640 points in a full week. (A one point operation is one that may be performed in one minute at normal speed.) The present agreement provides that the wage of the above-mentioned average worker shall be ten per cent higher than that of the minimum. In other words, 2640 points should return a wage ten per cent more than the minimum scale for the class of that worker. Each worker ascertains his own price per point (which remains constant until a new wage scale is set) by increasing his minimum by ten per cent and dividing the sum by 2640. To ascertain the wage due him at any time he has only to multiply the number of points accumulated by this price per point."

At the last renewal of the agreement, the Union took a position for the abolition of standards, based, probably, on a fear that the engineer in charge was not truly impartial. The plan to be adopted shortly calls for two industrial engineers who may call in a third arbiter if necessary.

There has been, in the past, a great lack of continuity of employment in the garment industry and this evil has been overcome by the following plan:

"Each manufacturer lays aside each week a sum equal to ten per cent (formerly 7½ per cent) of his direct labor payroll to constitute an unemployment assurance fund. This fund accumulates, as the weeks go on, until some worker has exceeded eleven weeks of unemployment. That worker is thereupon entitled to draw upon his shop

unemployment fund to the extent of two-thirds of his weekly minimum. It is obvious, therefore, that if any employer can keep his workers from having twelve weeks of idleness he will retain this fund. The appeal of this growing fund, staring the employer in the face day by day, is very great and impels him to use every effort to increase the work of his factory to the desired forty-one weeks minimum. It will be seen that the liability of the manufacturer is limited to ten per cent of his payroll and that it is possible for his workers to have unemployment in excess of the amount of the fund. This, however, very rarely happens.

The fund is not actually laid aside, but the employer gives a surety bond to the board of referees in an amount equal to the contemplated ten per cent of his payroll. This prevents holding idle capital and yet fully protects the worker."

The results of the use of this plan indicate that progress is rapidly being made toward the lessening of the evil of unemployment in this most difficult of all industries.

"A system of government boards and courts in industry should be approached with the greatest caution and only as a last resort. Just as family disputes should be settled within the home, so industrial disputes should be settled within the industry. Wise is that industry which provides its own means of settlement rather than to force a dictum by the state. That it can be done, the Cleveland garment industry has demonstrated. What has been done there can be done in any industry organized or unorganized. The three foundation stones of the Cleveland agreement can serve in any other:—The settlement of wages by representatives of the disinterested public; an incentive for production upon the part of labor; and an incentive to provide employment upon the part of the employer."

*Business Cycles and Unemployment.* U. S. Department of Commerce, 1923.

Reports the findings and recommendations of a committee of the President's Conference on Unemployment.

Herbert Hoover explains in a foreword to the Report, and the report is but a preliminary discussion of the subject, that "the President's Conference on Unemployment which met in Washington in September, 1921, was called primarily to consider relief for four to five million unemployed resulting from the business slump of 1921. During the formulation of emergency measures which subsequently proved successful in greatly alleviating the situation, the responsible business men, labor leaders, and economists of the conference advanced the proposal that an exhaustive investigation should be made of the whole problem of unemployment and of methods of stabilizing business and industry so as to prevent the vast waves of suffering which result from the valleys in the so-called business cycle.

"It was the view of the conference that certain suggestions for controlling extremes of the business cycle so as to lessen the losses due to recurrent periods of unemployment, were worthy of serious consideration and that in any event a thorough study of the business phenomena of booms and slumps would serve to advance public knowledge and stimulate thought toward constructive solution. Accordingly I appointed the following committee to undertake an investigation and report:

Owen D. Young, chairman of the board, General Electric Co., chairman; Joseph H. Defrees, former president United States Chamber of Commerce; Mary Van Kleeck, Russell Sage Foundation; Matthew Woll, vice president, American Federation of Labor; Clarence M. Woolley, president American Radiator Co.; Edward Eyre Hunt, secretary of the President's Conference on Unemployment, secretary.

"An exhaustive investigation was undertaken with the assistance of appropriations toward its cost from the Carnegie Corporation and with services contributed to the committee by the National Bureau of Economic Research, the Russell Sage Foundation, the Federated American Engineering Societies, the United States Chamber of Commerce, the American Federation of Labor, the American Statistical Association, the American Economic Association,

the Bureau of Railway Economics, the Department of Commerce, and a number of others."

Millions of wage earners were out of work in 1921, and although the first responsibility of the conference was to urge upon local communities plans to diminish suffering, it was also recognized that fundamental conditions must be studied in order that proper action might be taken in the future, for the World War was not solely responsible for the depression—we were then at the bottom swing of the business cycle.

The committee was impressed with the scarcity of sound statistical and economic data, and hopes that business organizations banking associations, labor organizations, trade associations, chambers of commerce, and individuals may do their part toward the collection and distribution of the information that is so much needed before any really scientific solutions of the various phases of the problem may be attempted.

### *The Business Cycle*

The term "business cycle" "covers a long series of influences in which a more or less unknown part is played by the individual establishment, by the industry of which it is a part, by conditions in other industries, and by credit conditions and policies."

In order to limit the scope of the report the committee eliminates from the above definition seasonal changes in particular trades, and leaves this phase of the problem, as well as problems of distribution, marketing and finance in their relation to land ownership and agriculture, to other groups for study.

### *Control of Business Cycle*

Control of the business cycle may be effected by the use of methods for the prevention of excessive expansion, by the use of methods for reducing the extent of the decline, and by alleviating the distress caused by the depression. Any method of control of conditions which will tend to damp excessive expansion will naturally lessen the extent of depression.

The remedies suggested by the committee for the direct prevention of expansion or inflation and for the prevention of unemployment are as follows:

Control of credit expansion by banks generally.

Possible control of inflation by the Federal reserve system.

Control by individual business men of the expansion of their own industries.

Control of public and private construction, including construction by public utilities, at or near the peak of the business cycle.

Construction of public works in the depression.

Unemployment reserve funds.

Federal and State employment bureaus.

From the analysis of individual examples of business experience in several fields, it is evident that the knowledge of one's own business should be strengthened by a knowledge of the conditions in the industry of which it is a part, and by information about current and future trends in *general* business conditions. This program places the business man in a strong position to exercise judgment based on facts rather than on guesses.

### *Recommendations*

*I. Collection of data.* Each individual establishment must assemble the data bearing upon the trends of its own business. This may be made available to other firms in the same industry or to firms in other industries by the formation of a pool of fundamental facts in a trade association, or by exchanging the information for that of the firm's customers. Certain information may be obtained also from government bureaus.

Secretary Hoover has established in the Department of Commerce a monthly survey of current business which summarizes the data obtained from information collected by the Department of Commerce, by other Government bureaus, and by trade associations. The major portion of the material presented by the Department of Commerce is based upon data furnished either by firms or by trade associations. Since the indi-

vidual returns supplied to the Department of Commerce are protected by special statute and are not available in their individual form for any other purpose, reluctance to reveal facts to competitors is not a valid reason for refusal, and this refusal of certain firms to coöperate, although they constitute a minority, seriously diminishes the ability of other business men in the same industry to form proper judgments.

There is evidence of an increasing need for prompt return to business men and bankers of facts concerning rates of production, stocks on hand and in transit, price trends, volumes of sales, money rates, freight movements, and employment statistics.

*II. Larger Statistical Service.* The committee recommends the expansion and standardization of forms and definitions of terms in order that the Department of Commerce may speed up the publication of complete reports. The following list of commodities, which were suggested to the committee by experts as most significant in showing the trend of the business cycle, should be collected by telegraph for immediate release: raw wool and woolen textiles, raw cotton and cotton textiles, hides and leather and shoes, iron and steel and fabricated products, zinc, lead, copper, and their products, and bituminous coal. The statistics of the industries which these commodities represent might later be supplemented by the statistics of other industries, and be published monthly.

*III. Research.* Although a primary necessity is the collection and dissemination of fundamental data, there follows a need for special research into economic forces. The results of the more constructive and thorough research, which should be carried on by individual companies, could well be checked by the results of research carried on by outside organizations and universities. "Research as to the effect of different trends and economic forces is, however, a different problem from forecasting. Such research should be carried on continuously by the Government bureaus, because the data available to these bureaus are more extensive than those available to other institutions, which must depend upon published summaries of Government data."

*IV. Control of Credit Expansion by Banks.* Since the state of the individual banker's customers' businesses and the state of the businesses of other firms are interdependent the banker must assume a great deal of responsibility, and therefore needs access to a large fund of business knowledge. The committee recommends that bankers ask their customers to maintain, during a period of rising prices and business expansion, an increasing ratio of quick assets to current liabilities. A reasonably liberal policy on the part of banks and the reserve system is looked on with favor during a depression, for too great a reduction of an individual bank's loans from the reserve bank may necessitate too great a pressure on its customers.

*V. Possible Control of Inflation by the Federal Reserve System.* Although the only automatic check upon the expansion of bank loans in a period of prosperity is the requirement of law that the banks shall maintain a certain specified minimum reserve against their current liabilities, there should be an additional check on inflation through the individual banker's realization of his responsibility to the community.

"In a government such as ours the most difficult question to solve from the very beginning has been how to centralize in individuals sufficient power to enable the Government machinery to function wisely and promptly and at the same time to impose such restraints and balances as to guard against autocratic or arbitrary exercise of such power. This is the problem which faces us in the development of the Federal reserve system to its maximum usefulness, and it is a problem worthy of most careful and thorough study by bankers and associations of bankers."

*VI. Control by Business Men of the Expansion of Their Own Industries.* More steady employment will result from a firm's approach to a period of depression in a strong financial condition, and this stability of a concern may be better brought about through "planning production in advance and with reference to the business cycle, laying out extensions of plant and equip-

ment ahead of immediate requirements with the object of carrying them out in periods of depression and carrying through such construction plans during periods of low prices in conformity with the long-time trend, the accumulation of financial reserves in prosperity in order to mark down inventories at the peak, and the maintenance of a long view of business problems rather than a short view."

*VII. Control of Private and Public Construction at the Peak.* Postponement or cessation of construction work during boom periods have been proved satisfactory not only to individual firms, but also to industry as a whole. These practices are of particular value in keeping low the ratio of fixed investment to productive capacity.

Some of the difficulties encountered in advocating the use of this policy are the tax situation, which makes it appear advisable to be extravagant in maintenance charges in good times and the inability of business men to see anything but unlimited demand ahead.

"The essential steps in any general program are to plan construction work, private or public, long in advance with reference to the cyclical movement of business, and in the case of public works to pass the necessary legislative appropriations when facts about the trend of business show that it is sound policy to spend money for such purposes.

"If it were possible for a smaller percentage of public-works projects to be undertaken in periods when private industry is active, so that more work might be done during periods when private industry is slack, the Government would not compete with private industry to so great an extent in times of prosperity, and thus would not be a factor in the inflation of money rates, prices of materials, and employment.

"The committee calls attention to the need for careful drafting of laws to insure a policy of reserving public-works projects, if this is to be done effectively. The need for fixing the responsibility for the preparation of such plans in advance, the importance of securing the release of the projects at the right time by legislation, and the provisions for financing should be considered with special relation to the obstacles, legal and others, which the particular public authority would have to overcome. While the difficulties are great, everything which can be accomplished in this way is valuable."

*VIII. Public Utilities.* "In the interest both of utilities and of the buying public it is obvious that the normal time to finance new construction or improvements in public utilities is in periods of depression, when interest charges are reasonable and costs of construction low, but the delays encountered at such times in obtaining the necessary authorizations by public regulating bodies may in many cases be such that the favorable money market is lost. This is a problem to be studied by public-service commissions and similar bodies, which can by prompt action meet this difficulty.

"In so far as the managers of utilities and public-service commissioners can regulate construction in order to fill up the valleys and lower the peaks of the business cycle they will aid in alleviating the extremes of the cycle, and by means of their economies they will keep their capital investment from unnecessary expansion, to the advantage both of the utilities and of the public."

*IX. Unemployment Reserve Funds.* Loss of employment is not felt alone by the worker, but also by business as a whole through the decrease in buying power on the part of the worker. Although plans whereby employers, employees, or both, contribute during periods of employment to a reserve fund under separate or joint control to sustain workers when unemployed are designed to alleviate the evil effects of unemployment rather than to decrease it, yet these plans deserve serious consideration. One of the major difficulties met in advocating these systems is the lack of adequate data from which to determine prospective unemployment. The committee cannot recommend a definite program for this situation, for very few experiments of this nature have been studied by individual firms.

*X. Employment Bureaus.* It is for the reason that they will show through the

medium of their reports the demand for labor and the number of workers seeking positions (which will mean another measure of business conditions) that the committee heartily approves of the conference's recommendation of a national system of employment bureaus. "If employment bureaus are organized effectively enough to insure transfer from one position to another with the least possible loss of time, they will make labor more immediately available and thus prevent loss of production for the employer and loss of income for the wage earners, thus helping to maintain the level of purchasing power.

It is obvious that any measure which tends to maintain the level of purchasing power tends to stability in business."

In conclusion, the committee would reiterate its conviction that unless business men, bankers, and others who are responsible for policies and practices in industry begin without delay to study and to act in order to meet the problems of unemployment and business cycles, solutions which may prove to be fundamentally unsound will be attempted without the benefit of practical experience. No problem before the business world today offers a more inspiring challenge to sound industrial leadership.

*World Action on Labor Problems.* ALBERT THOMAS. System, April, 1923, Vol. XLIII, No. 4, pp. 447–449 and 537.

With our modern transportation systems and our progress in world trade, most of the manufactured articles of today are assembled from materials brought from widely scattered countries. International interests are involved in the manufacture of these articles, and although in most cases problems requiring international adjudication do not arise, there are certain cases where these problems do arise.

It is the aim and purpose of the International Labor Office to reach international agreements on these problems, and to use a simpler method than is customary in old-fashioned diplomacy. The Office was created by a clause in the Treaty of Versailles and is financed through the League of Nations. However, it possesses its own constitution and complete autonomy. Nations which are members of the League are automatically members of the Labor Office, but a nation does not have to be a member of the League to be admitted as a member of the Labor Office.

This organization is in the nature of a secretariat, a permanent body composed of twenty-four representatives, of whom twelve represent governments; six, employers; and six, workers. These members are elected by a general conference which meets at least once a year and which is representative of fifty-five nations. The Conference members are four from each country of whom two are direct government appointees; one, a representative of the principal organization of employers in the country, and one, a representative of the principal labor organization. All four are appointed by the government of the nation of which they are citizens.

At each meeting of the Conference a definite program of action is considered which consists of problems and proposals arranged several months in advance. Correspondence on each problem passes between the Office and each government, in order that all views of the situation may be obtained before making up the program for the Conference. A two-thirds vote is necessary for the retention of a problem on the program.

A proposal requires a two-thirds majority vote in the Conference in order to pass. After favorable action by the Conference, ratifications must be sought from the several governments, who may discard the measure if they see fit. It is necessary at times to recognize special conditions as claimed by certain nations.

It seems to me completely demonstrated that in those problems which are unquestionably international, international solutions are absolutely essential. And they can be reached with a reasonable degree of ease and certainty, only through some such agency as that established in the International Labor Office.

*Resolution on Restoration of Production.* Industrial Management, July, 1923, Vol. LXVI, No. 1, pp. 5–6.

Reports the following resolution submitted by the American Delegation to the Industry and Trade Group at the Rome Congress of the International Chamber of Commerce.

*Whereas*, it is increasingly clear that the national wealth and community and individual prosperity depend to a large extent for maintenance and increase on expanding individual production in all lines of industry and that the greater the production, the greater the benefit to all concerned, and

*Whereas*, international credits to facilitate production and exchange of goods can rest only a sound basis of material values, and

*Whereas*, real costs of production in various places and in various lines remain abnormally high and efficiency of production and individual output frequently remain lower than before the World War, and

*Whereas*, the present depressing burden of after-war responsibilities to be liquidated by taxation of workers and producers, can be best alleviated by increasing individual production and especially by increasing the output of man-power through the service of science and invention, which should not be hampered or defeated by artificial rules and arbitrary restrictions, and

*Whereas*, national figures of accumulated wealth and the published records of particular lines of industry and particular industrial establishments offer eloquent evidence of the benefits derived from the introduction of scientific and efficient methods.

*Therefore, be it resolved*, by this Congress of the International Chamber of Commerce, that the following principles be recommended for increasing production:

1. Enlargement of production by every invention and mechanical device which offers economy of production.

2. Elimination of all artificial restrictions and recognition of the need of maximum individual output on the part of all concerned in production.

3. Stimulation of individual effort by personal remuneration based on relative individual output.

4. Governmental policies which encourage existing industries and the creation of new industries—especially by a lowering of taxation as soon as possible.

5. Adoption of governmental policies which will permit not only taxpaying ability on the part of directors of industry and workers, but also opportunity to save and give the incentive of security in the enjoyment of the earnings of exceptional ability and effort.

6. Recognition and assurance of the advantages of private ownership and operation of business enterprise as contrasted with State ownership and operation, such State operation having been proved by experience to involve burdens of unnecessary personnel and other expense, and difficulties of adjusting charges for service, all of which hamper rather than stimulate production and economy.

7. Taking immediate steps to see that men engaged in nonproductive pursuits are diverted as soon and as generally as possible to productive labor.

*"He's a Better Workman Now."* Homer E. Niesz. System, June, 1923.

The Commonwealth Edison Company has found that the adoption of the Group Insurance plan has a splendid effect on the general morale of the company. Up until 1920 it had been a policy of the company to give each employee a turkey at Christmas. Wishing to make this gift a more permanent one, the idea of group insurance was taken up at a meeting of the General Joint Council, consisting of official and employee representation. The idea was enthusiastically approved and on the following Christmas each employee was given an insurance policy in proportion to his length of service.

A feature of the insurance program which has been enthusiastically received by 75 per cent of the employees, is additional insurance at exceptionally low rates—the amount of additional insurance is purposely apportioned to length of service.

Using factors and the company magazine the company has exploited the general idea of insurance until it has become one of the essential components in maintaining the welfare of the company's employees. Below is a table showing how additional group insurance is apportioned:

| LENGTH OF CONTINUOUS SERVICE | AMOUNT OF ADDITIONAL INSURANCE | COST PER MONTH |
|---|---|---|
| 12–18 months | $500 | $.50 |
| 18–24 months | 750 | .75 |
| 2–3 years | 1000 | 1.00 |
| 3–4 years | 1200 | 1.20 |
| 4–5 years | 1300 | 1.30 |
| 5–6 years | 1400 | 1.40 |
| Over 6 years | 1500 | 1.50 |

*Progress in Health Conservation during the Past Fifty Years.* G. M. KOBER, M.D., LL.D., Professor of Hygiene, Georgetown University, Medical School, Washington, D. C. Public Health Reports, April 6, 1923, Vol. 38, No. 14, pp. 725–739.

Surveys the history of Hygiene and Sanitation, and also forecasts the future in this field. Hygiene has received such an impetus within the past 50 years that many persons regard it as of modern origin. Such however, is not the case for, even in early times we find that the health of the population was the subject of serious consideration and legislation. Although it received the attention of the Egyptians, the Greeks, and Romans, during the Middle Ages sanitation received a decided set-back. War, ignorance, and prejudices seem to have constituted the ruling spirit, and for many reasons this period stands out the most unsanitary era in the annals of history.

With the development of the modern factory system of increased production in the latter part of the eighteenth century came also a concentration of the population in manufacturing districts and diseases of occupation and accidents assumed more and more importance. It was then that sanitary reforms were adopted in some European countries.

It was in the nineteenth century that there was an especial impetus in the field of hygiene, particularly since the invasion of the cholera epidemics in 1830 and 1849–50. England took the lead in sanitary reforms, and other countries followed. Much attention was paid to vital statistics, the establishment of health boats, enactment of health laws, etc.

As to the progress of sanitation in the United States, up to the close of the eighteenth century and for several decades of the nineteenth, almost the only health legislation which was enacted in the different states of the union consisted in a few laws relating to smallpox, since this pestilence was scarcely ever absent for many years at a time from any city or village until after the general introduction of vaccination. In September, 1872, the American Public Health Association was organized, and in March 1878, Congress created a National Board of Health, whose duty it was to investigate the causes and means of prevention of contagious and infectious diseases, to indicate measures of national importance, and to be a distributing center of information relating to public health.

The question is asked, has human suffering been mitigated and prolonged by the efforts of sanitation. It is estimated that the average length of human life in the sixteenth century was between 18 and 20 years, and at the close of the eighteenth century it was still less than 25 years. At the close of the nineteenth century it was between 45 and 48 years, whereas today it varies in different countries from less than 25 in India, to 60 years in New Zealand and 56 years in the United States.

Due to the birth of scientific medicine, and achievement of animal experimentation such a prolongation of life has been possible. It is estimated that it will be possible, even without further additions to our knowledge of causes and prevention of disease, but simply by application of knowledge already gained and as yet unapplied, to add at least 20 years to the span of life within the next 50 years, and provided we maintain our present standards of civili-

zation and correct living, the average of life may reach the biblical three score and ten in 1950.

*The Safety Committee at Work.* C. T. Fish. National Safety News, August, 1923, Vol. 8, No. 2, pp. 25–28.

Deals with the problem of getting results from the plant safety committee.

The safety movement generally begins with considerable enthusiasm but dies down during succeeding months. A safety committee must have the coöperation of every employee in the plant if it is to be effective. To keep the workmen interested, they must be given some responsibility for maintaining safety conditions, and the importance of their coöperation must be acknowledged in some way. There can be no standardized form of safety organization for a plant; there will generally be considerable experimentation before the most satisfactory method can be determined. "The consensus of opinion is that the plant safety committee is a very desirable part of organized safety work." The best results are obtained by giving as many men as possible a chance to serve on the committee. "The common practice is to allow each member to serve for three months, although some firms appoint men for one year or longer." Still others think it best to appoint one new man at a time.

J. D. Jones, General Manager, Algoma Steel Corporation, Sault Ste. Marie, Canada, says, "Formation of the shop committee is the groundwork for all safety activities." The shop man can impress his 'buddy' more effectively than the management. "The committees (15 in all) inspect their own departments to see that dangerous places are properly guarded and work to educate their fellow employees against unsafe practices."

The Corn Products Refining Company, Chicago, has a general committee which "reviews the recommendations submitted by the workmen's committee as well as accidents that have occurred during the previous month." The workmen's committee, consisting of one laborer, one millwright, and one electrician, sometimes the foreman, makes inspections and reports to the general committee. Both committees meet and discuss plans for safety.

The Carnegie Steel Company, Pittsburgh, has a general safety committee. Each plant has a committee, as well as each department.

The Pennsylvania Salt Manufacturing Company's committees date back to 1911. It has a permanent executive committee, central safety committees at each plant, and plant safety committees. The central committee passes upon the recommendations made by the plant committees.

The Interstate Iron & Steel Company, Chicago, has found that "more can be accomplished by supplying the safeguards which the men recommend than those which are provided without taking the men into consideration."

W. W. Thompson, Manager, Seattle Can Company, Seattle, says, "Supervision of the foreman is the most important factor in accident prevention. Mechanical guards come next, bulletin boards third, and safety committees last."

Putting the responsibility for accidents upon the superintendent and foreman is the plan followed by the Steel and Tube Company of America. "This creates keen competition and the fellow with the worst accident record immediately tries to make his department safer."

Whenever Bird and Son, Inc., East Walpole, Mass., has a lost time accident, the foreman of the department "must appear before the plant safety committee to explain the accident and tell what steps have been taken to prevent a recurrence." The company has eight safety committees, the plant superintendent being the permanent chairman of each committee. The plant is inspected monthly.

Crompton and Knowles Loom Works, Worcester, Massachusetts, has a safety representative in each department. Committee meetings are not held.

Fisk Rubber Company, Chicopee Falls, Massachusetts, has a special committee to cover the inspection of its plant. Its chief committee is the "Safety Booster Organization" (composed of 75 workmen), which reports dangerous conditions. The

boosters, selected by their foremen, serve three months.

Striking results have been accomplished by the safety committees of all the larger railroads in the United States. The Union Pacific Railroad has 70 safety committees which include permanent central (composed of chief executives), division, terminal, and local shop committees. "The majority of problems are disposed of in the division committee but those which involve a change of policy for the whole Railroad are passed on to the central committee." In 1922 there was a decrease of 18 per cent in train and service casualties, and 21 per cent in industrial casualties.

Wilson & Company, Chicago, has "a safety committee at every plant operating individually or through the joint representation committee."

While there is some difference of opinion as to the efficacy of the workmen's safety committee in all plants and under all conditions, testimony indicates that the larger companies with plants in various sections of the country have found the safety committee an effective medium for inspiring and maintaining the interest of the man on the job in the safety of his work and surroundings.

*On the Possibility of an Applied Psychology.* W. V. Bingham. Psychological Review, July, 1923, Vol. 30, No. 4, pp. 289–305.

Describes the conditions which warrant a separation of psychotechnology from psychology as a pure science.

"As engineering is to physics, as scientific agriculture is to biology, as medicine is to physiology, as pharmacology is to physiological chemistry, as forestry is to botany, as statistics is to mathematics, as navigation is to astronomy, so ought psychotechnology to be related to psychology." Up to the present time psychology and psychotechnology have been little differentiated. However, this identification is being questioned today, as may be seen from the fact that the American Psychological Association has formed a section for practicing psychologists, with standards of eligibility which all psychologists cannot meet. "Tomorrow the young discipline of applied psychology, with its journals, its own specialists, its own body of scientifically verified content, and its own technique, may be amply able independently to pursue its own proper objectives—the useful prediction and control of human conduct."

Some highly able psychologists question not only the fact of an applied psychology, but also the possibility of such a science. It becomes necessary then to show the nature of its content, of its differentiae, and its aims.

Psychometric procedure is so dotted with bits of specific skill and technique that inexperience inevitably leads to blunders. The following points in technique were discovered in the work carried on at Carnegie Institute of Technology:

1. When it is necessary to resort to subjective estimates or ratings, more reliable results are obtainable by aid of well constructed *graphic* rating scales than by any of the earlier forms of rating scales.

2. Group tests of intelligence are more useful than individual tests for purposes of an initial inventory.

3. Time-limit methods yield better measures than amount-limit methods.

4. Omnibus tests are superior to separate tests for practical service, but not for research purposes.

5. In measuring amount of information or degree of skill, stencil examinations—that is objective test questions calling for answers that are definitely either right or wrong—are superior to questions where the answer contains an element of value to be estimated by the examiner.

6. But the stencil examination does not measure creative powers.

7. Intelligence tests are less predictive of success in social occupations, such as selling than are interest analyses.

8. In predicting probable success in many types of positions, it is essential to determine an upper critical score, as well as a lower limit on the intelligence scale.

These sample illustrations of technique are obtained in part from practical experience and in part from scientific experiment. Not one of them was known in 1915. It is

from the accumulations of such seemingly small and obvious principles as these that there is being built the growing structure of applied psychology.

"Applied psychology in the broadest sense is *psychology in the service of ends other than its own.*" This definition would be suitable if one could but learn the proper aims of psychology itself. Many traditional psychologists construe their task as finished when the facts of human nature are adequately observed, analyzed, classified, described, and explained. There are other psychologists who aim at the control of human conduct as their ultimate. "Progress in the science itself and in its applications will, I believe, be fostered if all schools of doctrine recognize that there are these two sharply divergent objectives, the scientific and the technological."

There are objectors to the distinction between psychology as a pure science and applied psychology who base their objections on the theory that "he who really understands . . . . already has in his possession the reins of mastery." This, of course, is false logic, and not only *can* be proved false, but *has* been proved so by those embarrassing situations in which well-grounded psychologists have found themselves still not equal to the task of properly administering tests. Knowing the principles of technique, and applying them, are quite different.

The methods used in industrial psychology, although they are chosen with a view to such industrial criteria as immediate needs and costs, should be chosen also for exactness.

That technology and science are not inseparable may be learned from the history of applications made in the useful arts. "Many a strong stick was used as a crowbar before Archimedes enunciated the principle of the lever." Psychotechnology is no exception here; there must be developed in this field dependable, empirical techniques that far outrun general theory.

*Testing Tests.* W. S. Berry. Scovill Bulletin, July, 1923, Vol. IX, No. 3, pp. 5–7.

Reports an experiment in the Scovill Manufacturing Company in testing tests for apprentices in the Machine and Tool Department. The tests used were the "Cube Test," and "Spatial Perception Test," the "Stenquist Mechanical Aptitude Test" and a "Mental Alertness Test" (Test VI of the Bureau of Personnel Research, Carnegie Institute of Technology).

Charts are presented showing the results of the tests and the results of the trials to date show that the proper tests, used in the right way, give a pretty accurate indication of the ability, and probable chance of success, of those examined. Tests are useful in determining in a short space of time the line of work that the person is the best fitted for. The practical application of tests is to help direct new employees into lines where they will have the best chance of success. They are not to be used as a means of denying employment, but, after an applicant has been employed, the tests will be a valuable addition to our present methods of determining what job to put him on.

*Preventing Mis-Fits by Applied Psychology.* Bruce V. Moore. Industrial Management, July, 1923, Vol. LXVI, No. 1, pp. 59–63.

Reports the results of the special problem of working out scientific methods of selecting, differentiating or segregating, and placing graduate engineers coming directly from colleges and technical schools to the Westinghouse Electric and Manufacturing Company.

The writer states that he is attempting to give the man who is not a specialist in the field some conception of the nature and real possibilities of psychological tests in the selection and placement of technical graduates in industry. To do this he gives a concrete example of the construction, application, and results of tests in connection with the above problem.

*Social Rating of Best and Poorest High School Students.* Paul V. Sangren. The Journal of Educational Psychology, April, 1923, Vol. XIV, No. 4, pp. 209–214.

It is apparent that a fairly high correlation exists between scholarship and scores

on intelligence tests. It would be interesting to know (1) whether there are qualities in addition to intelligence which affect scholarship, and (2) whether the best students do not also possess greater possibilities of success in the practical world. Upon these two points the writer, while superintendent of schools at Zeeland, Michigan, had opportunity to collect some data.

Zeeland high school is small, the enrollment being 165 students. This, together with the fact that many of them had been in the system one or more years, made it possible for the 9 high school teachers to become well acquainted with the students. Teachers could, therefore, be counted upon to pass fairly intelligent judgment upon the qualities and traits possessed by individual students.

All high school teachers constructed independently a rating scale using the following eight abilities or qualities: methods of work, application, industry and attitude toward work, ability to assimilate new ideas, physical vigor, social and personal qualities, leadership, and team-work. There were 5 degrees for each of these qualities with numerical ratings to correspond, these degrees and ratings being divided as follows: best student, 38; better than average, 30; average, 22; poorer than average, 14; poorest student 6. The scale was, therefore, modelled after Form B of Rugg's Rating Scale for Judging High School and College Students.

Having completed the construction of their scales, the teachers rated 24 high school students by direct comparison with their own scales. Of the students rated, 12 were students who made high scores on Terman's Group Test of Mental Ability and averaged over 90 per cent in all of their school work for the months of September, October, and November, and 12 were students who made low scores on the Terman test and averaged less than 83 per cent in all of their school work for the three school months mentioned. Of each of the two groups of 12 students, 3 were selected from each of the four high school grades. Teachers were instructed to pass judgment upon no student whom they did not know well and to rate numerically. They were not told how the students were selected.

When scores on the Terman Group Test of Mental Ability are taken as measures of intelligence and average marks in all subjects for September, October, and November are taken as measures of "scholarship" and "citizenship" qualities possessed by the poorest and best high school students at Zeeland:

1. The twelve students of the four high school grades who are rated high in intelligence and scholarship are rated "better than average" in industry and attitude toward work, methods of work, application, and ability to assimilate new ideas. The twelve students of the four high school grades who are rated low in intelligence and scholarship are rated "poorer than average" in these same qualities.

2. When average ratings of individual students are considered, those who are above average in intelligence and scholarship are rated above average in the qualities mentioned in Conclusion 1, while students individually rated below average in intelligence and scholarship are rated below average in these qualities.

3. The correlation between intelligence and the total rating in methods of work, industry and attitude toward work, application, and ability to assimilate new ideas is high, being 0.85. The correlation between scholarship and these qualities is very high being 0.93.

4. The 12 students who are rated high in intelligence and scholarship are rated somewhat above average in the qualities of physical vigor, social and personal qualities, leadership, and team-work, while those who are rated low in intelligence and scholarship are rated "poorer than average" in these qualities. This holds true in the individual rating and comparison of students as well.

5. The correlation between intelligence and the total rating in physical vigor, social and personal qualities, leadership, and team-work is fairly high, being 0.77. The correlation between scholarship and the qualities just mentioned is very high, being 0.92.

Thus it would appear that (1) scholarship of high school students is determined by the student's methods of work, application, industry and attitude toward work, and ability to assimilate new ideas as much as by intelligence; (2) that the best students possess in a greater degree the qualities which will make for success in the practical world, and that (3) although the brilliant student is often heralded as a "freak," it would be safer to gamble upon his success than upon the success of a poorer, less intelligent student.

*"Power" vs "Speed" in Army Alpha.* G. M. Ruch and Wilhelmine Koerth. The Journal of Educational Psychology, April, 1923, Vol. XIV, No. 4, pp. 193–208.

The most important study of the *speed versus power* tests of mental measurement hitherto reported, was one carried out during the war by Dr. Mark A. May under the direction of Dr. Lewis M. Terman, in which a correlation of 0.965 was computed between scores earned on Army Alpha during regular time limits, with those earned during double time limits, on 510 cases. The investigators concluded that in general, there is no reason to assume that an extension of time limits will improve the test, or give an opportunity to many individuals to materially alter their ratings.

Certain facts, listed below, are those on which psychologists have based the opinion that time limits, if not too strictly drawn, do not work undue hardship on the subjects taking mental tests in the great majority of cases:

1. The fact that there has been shown to exist moderately high, or high, correlation between speed and accuracy in tests of mental capacities like arithmetical abilities, naming of opposites, substitution tests, etc.

2. The fact that repetitions of the same tests give fairly uniform results; which, in other words, means that they show a satisfactory amount of self-correlation or reliability.

3. The fact that under practice individuals tend to gain, from period to period, in a consistent manner so that there exists high correlation between initial and subsequent performances.

4. And finally, the fact that the time limits for all carefully standardized tests have been experimentally determined in such a way as to guarantee that the majority of subjects do have time to complete all or nearly all of the test items which are within their capacities.

Ruch and Koerth used as subjects for their experiments at the State University of Iowa 122 freshmen of both sexes, who had previously taken the regular entrance intelligence examination during October, 1922. This group included 70 students who earned percentile scores falling in the lowest decile of the total distribution of scores, and 52 students who earned percentile scores falling within the highest decile. "The percentile ranks were based upon the combined scores of four intelligence tests as follows: the Thorndike Intelligence Examination for College Entrance, Part I (two forms and the practice form), Morgan's Test of Mental Ability, and the Iowa Comprehension Test."

In the first period the entire group was given black-leaded pencils to use in the recording of answers to Form 7 of Army Alpha, under the strict procedure of the Examiner's Manual.

In the second period the black-leaded pencils were replaced by blue-leaded ones, and the subjects were told to make any corrections and additions they wished, under the same time limits. No erasures of black pencil marks were permitted.

In the third period the blue-leaded pencils were replaced by red-leaded ones, and the subjects were allowed as much time as they wished for the completion of the test to their own satisfaction. The technique used allowed the compution of the scores earned in single, double, and unlimited time, separately, and the results are shown clearly in graphs and charts.

Comparing the college group with an army group of the same number of subjects it appears that the more intelligent (college) subjects gain more than the less intelligent subjects, and the variability of the more intelligent group (college) decreases, while the less intelligent group (army) shows an increase in variability.

It has been concluded from the results of this investigation that the Army Examination Alpha is not entirely satisfactory

as an instrument for studying the factors of *speed versus power*, and for use with college students as subjects it must be replaced by a test with more "top." It is thought likely that with such a test the bright subjects might be found to improve more, not less, than the duller ones.

With this general limitation in mind and properly allowed for in interpreting the results of the present study, the following conclusions are suggested as being indicated by our data:

1. Admitting that Army Alpha is largely a *speed* test, the fact that single time correlates 0.966 with double time, and 0.945 with unlimited time indicates that the *speed* factor does not seriously invalidate the test. In fact, it can be shown from figures already presented that the probable error of estimating scores for double time and for unlimited time from scores earned in single time is about 6.7 and 8.4 score points, respectively.

2. Increasing the time allowance does not permit dull subjects to equal the scores of the more intelligent subjects. In fact the mean of the low group for unlimited time was still well below the mean of the high group for single time (Figures 1–3). Whether the differences between high and low groups are decreased or augmented by increasing the time limits cannot be definitely answered from the present data because the scores of the high group were too near the maximum possible to allow equal opportunity to both groups. The Army figures seem to indicate that, in terms of absolute scores, the brighter subjects improve somewhat more than do the dull.

3. When total scores are considered, there was no increase in the amount of overlapping of the high and low groups when the time allowances were increased.

4. Rather marked differences in susceptibility to the influence of the speed factor were evident in the different tests, certain ones being much more open to this objection than other. This fact suggests a new criterion for the validation of tests, scales, and other types of measurements. The only test which was invalidated by the increased time limits was Test 3 (Practical Judgment). Test 1 (Oral Directions), is also not very satisfactory. Test 2 (Arithmetical Problems) and Test 4 (Synonym-Antonym), became even more discriminating with added time.

5. The present results substantiate the important findings of the earlier Army investigation when proper allowance is made for the fact that Alpha is far too easy for the good students of the college group. The correlations reported by the two investigations are in striking agreement.

*The Endowment of Scientific Research.* MARK H. LIDDELL. Science, May 25, 1923, Vol. LVII, No. 1482, pp. 612–613.

Reports a proposed solution of the difficulties arising from the alleged taking over of the research functions of the university by wealthy corporations.

The following questions are raised: "If corporate capital is robbing our universities of their best research professors, should not the fact constitute a stimulus for increasing the diminishing supply rather than a cause for deploring the demand? And if it is lamented that great benefactions to scientific research as now administered do not produce the results one would rightly expect, is not that a reason for changing the prevailing modes of administering these great trusts, rather than a ground for discouraging them altogether?"

It is idle to maintain that great corporations can exhaust the most interesting fields of modern science; for every new scientific discovery opens up a dozen new problems of scientific research. Moreover, the fact that these corporations with their great capital of wealth and inventive brains are every day providing science with improved tools for research that university resources could never hope to supply is constantly ignored by these Jeremiads.

Since these benefactions are supposed to be gifts to science and not gifts to persons, it would seem that if science does not derive benefit from them there is something wrong with the method by which they are administered, not with the gifts themselves.

That the prevailing mode of administering great benefactions in aid of science is not as efficient as it might be may be due

to the fact that those who determine the personal recipients of these funds and the particular research problems to which they shall be applied must decide these matters largely from a personal rather than from a scientific point of view. If the proposed benefaction is to be limited to some field of research, its application should be determined by the consensus of the majority of the most experienced research scientists in that field, and not upon the special predilections and enthusiasms of one or two of them, if it is to cover the whole field of scientific research it should first be impartially budgeted with regard to the needs of each particular field and then applied in accordance with the consensus of the majority of its most experienced representatives.

We now have special American organizations for research in the cardinal branches of science and a general clearing house for activities of American scientific research as a whole. By using these instrumentalities to determine the application of benefactions to scientific problems we should at least escape from the limitations of small groups of scientific almoners. Even though the results might not prove to be all that could be desired, the plan is well worth trying, especially in view of the fact that it seems already to have worked well on a small scale. Such a plan would at least prevent the frittering away of large resources upon schemes of research that are unwisely planned or prematurely undertaken or imperfectly coördinated with other activities of advancing science. And if it failed, it would at least put the responsibility of justifying these expenditures of wealth where it really belongs, upon American science as a whole.

With such a scheme of apportioning benefactions in the aid of pure science, the commercial utilities of research might safely be left to take care of themselves; for the large majority of the members of our scientific associations are themselves college professors and would know well enough what scientific problems needed the support of benefaction and what could be wisely left for solution to the selfish interests of commercial organizations.

*Federations of Scientific Men.* Science, May 4, 1923, Vol. LVII, No. 1479, p. 529.

Reports a quotation from "Nature" telling of the organization in France by brain workers of the Confederation des Travailleurs Intellectuels, and in this country the National Federation of Professional, Technical, Administrative and Supervisory Workers, having for the avowed object the improvement of the economic position of the professional classes.

*Report on the Proceedings of the Ninth Annual Convention of the Society of Industrial Engineers.* Business Economics, April, 1923, Vol. VI, No. 1.

Economics' Part in the Formulation Policy of Business Administration—J. H. Pardee.

(1) Suggests that business men obtain thorough knowledge of characteristics of business concerned.

(2) More common sense with respect to the theory of values.

(3) Acquaintance with facts regarding supply and demand.

(4) Selling price cannot always be fixed in relation to cost of production.

Mr. E. F. Du Brul discusses some particular aspects of this problem from point of view of machine tool builder.

Education Group Meeting—Dr. Lee Galloway, F. R. Fairchild, R. C. McCrea, E. J. Kunze, E. H. Schell.

Discussion based on proper economic background for business executive. Dr. Galloway says "the object of economic study is the acquirement of knowledge of the laws which concern the general welfare of society, and that the managerial interest in this study is to provide a background of economic information whereby business enterprise may be guided and controlled in harmony with the principles conducive to the general welfare."

Professor E. H. Schell gives in detail the work course in Engineering Administration at Massachusetts Institute of Technology.

The Place of Government in Fatigue Elimination—Henry J. Sponner, London.

Gives account of what British Government has done in the investigation of fatigue problems. Calls attention particularly to noise elimination.

The Part Government Can Play in the Elimination of Unnecessary Fatigue—Miss Nellie Swartz.

Describes report of Fatigue Elimination prepared by New York State Department of Labor. Gives important indicators of fatigue and remedies.

The Relation of Fatigue Elimination to Other Activities—Frank B. Gilbreth.

Describes an interesting stereoscopic device called the "Magster"—devised to record and teach the "One Best Way to Do Work."

Fatigue as a Factor in Causing Disease as Well as Social and Economic Loss—Louis I. Harris, M.D.

Believes fatigue responsible for much of heart disease among workers. Pleads for greater interest on the part of industrial physicians, in prevention of diseases due to fatigue.

The Financial Budget—A. J. Lutherbach.

Justifies use of budget, shows application and use in several specific cases.

Importance of the Elimination of Waste to the Economic Structure—Robert B. Wolf.

Says waste investigation indicates that to strengthen our economic structure, we should recognize:

1. Waste is essentially time spent when constructive thinking was absent.
2. Thinking process of workers should be stimulated.
3. Facts of past performance should be available.
4. Men should be rewarded in accordance with their accomplishments.
5. Giving production costs to the workers
6. Cost records should be available to workers.

Industrial Sanity—Sherman Rogers.

Says that in order to understand worker, employer must teach him the facts—so that he understands the game. Mainsprings are based on sentiments. Workers must be convinced employer is "on the square," before best work is accomplished.

Two Important Economic Factors: (1) Reducing Production Costs, (2) Keeping Workers Contented—Mathew Porosky, Chairman.

(1) Economic factors of Money and Men are treated from two aspects; that of Management and that of Operator. Papers read by J. A. Faust and W. M. Griger.

(2) Paper by Chas. Cheney, offers two practical plans for keeping workers contented; paper by O. L. Preble pleads for justice for workers. Sympathy and human kindness must be basis for thorough cooperation.

The Industrial Situation in Russia—Royal R. Keely.

Shows how Russia has suffered from ignoring economic laws. Gives historical back ground. Describes economic theory of Bolsheviki.

Managing Executives Group: The Measurement of Management in the Dairy Industry, Subsequent Discussion—Frederick E. Rein.

Gives an account of method for increasing sales and measurement of management. Describes score card applied to producers of milk.

Industrial Relations Group: How Can We Develop More Scientific Methods of Selecting People for Jobs—Chairman Earl P. Morgan.

Stresses the necessity for the reception of job seekers.

Miss Louise Moore says reputation for fairness is best advertisement to obtain workers. Perfunctory interviewing abolished. Uses performance test. Selection is preventive medicine reducing turnover.

Accountants Group—Industrial Accountant, Engineer; Where the Line of Demarkation?—Chairman J. P. Jordan.

Papers by W. B. Montgomery and A. F. Stock.

Attempts to define duties and responsibilities of both groups of men.